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CHARLES P. C. FLEURIEU

A VOYAGE ROUND THE WORLD 1790-1792 PERFORMED BY ÉTIENNE MARCHAND

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A

VOYAGE

ROUND THE WORLD,

PERFORMED

DURING THE YEARS 1790, 1791, AND 1792,

BY

ÉTIENNE MARCHAND,

PRECEDED

BY A HISTORICAL INTRODUCTION,

AND

Illustrated by Charts, etc.

TRANSLATED FROM THE FRENCH

OF

C. P. CLARET FLEURIEU,

OF THE NATIONAL INSTITUTE OF ARTS AND SCIENCES, AND OF THE BOARD OF LONGITUDE OF FRANCE.

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ERRATUM.

Page 13, Note *, for *Plate V.* read Plate VI.

A

VOYAGE

ROUND THE WORLD,

DURING THE YEARS 1790, 1791, and 1792.

CHAPTER VII.

Passage from the North-weſt *Coaſt of* America *to the* Sandwich *Iſlands.—Captain* Marchand *provides himſelf with refreſhments there, without anchoring.—Inquiries concerning the queſtion, To whom belongs the firſt diſcovery of theſe iſlands?—The perpendicular height of ſome of the mountains of theſe iſlands determined by approximation.—Run from the* Sandwich *Iſlands to* Macao, *through the Archipelago of the* Mary-Anne *Iſlands.—Occurrences at* Macao.—*The introduction of furs into* China, *by the ſouthern ports, had juſt been prohibited.—General conſiderations reſpecting the preſent ſtate of the fur-trade, and what may be expected from it in future.*

The run from the coaſt of America to the Sandwich Iſlands is equally deſtitute of intereſt and variety: Captain Marchand and Captain Chanal made it their conſtant buſineſs to aſcertain by frequent obſervations of the moon's diſtance from the ſun, and by the daily obſervation of the meridian altitude of this latter luminary, what was the gradual progreſs

of the ſhip in longitude and latitude; and by this ſeries of obſervations, they were confident of making a more direct courſe, and of preciſely hitting the iſlands which it was intended to make. In this run, as well as in all thoſe which had preceded it, they never neglected to determine the variation of the magnetic needle, as frequently as the weather would allow, either by azimuths, or by eaſterly or weſterly amplitudes. The reſults of their different obſervations are to be found in the *Notes* that accompany this narrative, and in the *Journal of the Route*, which preſents the data of the calculation *.

I ſhall content myſelf with mentioning two remarks, which might give riſe to a preſumption of the exiſtence of ſome iſlands that have not yet been perceived, or rather met with again.

In the night between the 14th and 15th, there was taken with the hand, a ſmall *land*-bird, ſpent with fatigue, which had ſettled on one of the yards. The latitude of the ſhip, at this period, was 40° 15′, and her longitude, correcting it by the obſervations made five days after, muſt have been about 133° 45′. The neareſt known lands, thoſe which lie to the northward of Cape Mendocino, were diſtant from the ſhip about a hundred and twenty leagues to the eaſtward. This diſtance of a hundred and twenty leagues is very conſiderable for a ſmall land-bird, unleſs it was of the ſpecies of thoſe which, as is related of ſwallows, although belonging to the land, contrive to reſt themſelves on the water, when the length of the paſſage exceeds the ſtrength of their wings. However, it would not be aſtoniſhing that, in latitudes hitherto little frequented, there ſhould exiſt ſome ſmall iſlands

* *See*, towards the end of this Volume, Notes XLV to LI, and the *Journal of the Route* at the dates of the obſervations of which the Notes preſent the calculation and the reſults.

which,

which, not being placed within reach of the tracks that have been followed by the known navigators of thefe latter times, might not have been perceived; yet fuch iflands might have afforded a retreat to thefe little birds which, being granivorous, or living on terreftrial infects, could not fubfift on the water, and are obliged to go and feek their food on the land. It might happen too that the Spaniards, in their ancient expeditions, had difcovered in thefe latitudes, fome iflands with which they muft have been acquainted before other nations; but it is probable that we fhall have no knowledge of the exiftence of any, and that we fhall not afcertain where they are fituated, till chance fhall have led fome navigators, of a nation more communicative than that which made the firft difcoveries, to find them again.

The fequel of the SOLIDE's voyage furnifhes us with a fecond remark of the fame kind.

On the 18th of September, in the afternoon, the fhip had reached the latitude of 32° 30′ north, and the longitude of about 139° weft: this pofition compared to that of the two neareft lands, placed her three hundred and feventy leagues from the SANDWICH Iflands, and three hundred and thirty from DRAKE's NEW ALBION.

It was at this diftance from known lands, that a fmall land-bird, of the fpecies of the canary, was feen to alight on one of the fhip's yards. It could not be fuppofed that fo fmall a bird could have come even from the neareft known land, that is to fay, that it could have made, all at one flight, a paffage of three hundred and thirty marine leagues: it was therefore prefumed that, in the north-eaft quarter, whence the wind blew, there exifts fome ifland, ftill unknown to modern navigators, to which this little bird belonged.

 I have

I have looked whether ſome ancient navigator might not indicate to us in this latitude, ſome ſolitary iſland that had not yet been found again: I ſee on the MANILLA galleon's chart, conſtructed from the private memoirs of the Spaniards, which Commodore ANSON ſeized upon, in 1743, when he took poſſeſſion of that ſhip, and which he has ſince publiſhed in the account of his voyage round the world; I ſay, I ſee a ſmall iſland under the name of ISLA DE LOS PAXAROS *(Iſland of Birds)*, ſituated in about 26° 30′ north latitude, and 22° 30′ to the weſtward of SAN JOSEPH in CALIFORNIA, or about 134° 30′ weſt from PARIS*. This poſition is leſs to the northward by 6°, and 4° 30′ leſs to the weſtward, than that of the ſhip which, conſequently, was one hundred and forty-three leagues to the north-weſt by north of this point. A ſmall bird could not have maintained its flight towards the north-weſt, in ſo long a paſſage, with the wind at north-eaſt: which muſt lead us to conclude that, if the Iſland of LOS PAXAROS exiſts, as we may believe, and if the little bird came from it, this iſland is not properly laid down on the chart of the galleon.

The general chart of Captain COOK's third voyage, places it in the latitude of 26° 30′, like that of the galleon, and in the longitude of 137° 20′; I know not on what authority. This ſituation would bring it nearer to that of the SOLIDE, which would be at no greater diſtance than one hundred and twenty-three leagues and a half to the north 13 or 14° weſt of it†. The paſſage will, no doubt, appear ſtill too long for a *Canary*-bird, eſpecially when

* According to the obſervations of the Abbé *Chappe*, in 1769, *San Joſeph* is 112° 2′ 30″ weſt from Paris *(Voyage en Californie, Paris, Jombert*, 1772, 4to. page 85 to 88.)

† In preſerving to the latitude of the Iſland of *Los Paxaros* the latitude aſſigned to it by the galleon's chart, ſome geographical calculations had led me to place it in longitude 139° 40′, on the charts which were conſtructed in 1785, and added to the inſtructions given to *La Pérouſe* to direct

when it is not wafted by a favourable wind which ſupports its flight, but, on the contrary, has to ſtruggle againſt a ſtrong reſiſtance.

All that it is allowable to conclude from this diſcuſſion, is, that it is very probable that the Spaniards have formerly ſeen an iſland in a latitude which is not very remote from the ſituation occupied by the SOLIDE on the afternoon of the 18th of September; and that this iſland muſt have been diſtinguiſhed by the multiplicity of its birds, ſince the navigator, who diſcovered it, impoſed on it the name of ISLA DE LOS PAXAROS: but, at preſent, what is the true poſition of this iſland? This is a problem which I leave to be ſolved by navigators who, in the ſequel, may frequent theſe ſeas: I could only point out to them the poſſibility of a diſcovery. We muſt, however, here recall to mind the ſtory of the *golden tooth**: might it not really happen that this little bird, whoſe unexpected appearance leads the geographer into diſſertations, was nothing more than a canary that had, perhaps, belonged to a ſhip paſſing by, from which it might have made its eſcape?

On the 21ſt of September, our voyagers began to ſee tropic-birds and *quebranta-hueſſos* or giant-petrels†.

On the 3rd of October, at half paſt two o'clock in the afternoon, the longitude of the ſhip, deduced from a mean between two ſets of lunar

---

direct him in his voyage round the world. If we give this poſition to the iſland, the *Solide*, on the 18th of September, was diſtant from it one hundred and fifteen leagues to the north 5° weſt.

* After ſome of the greateſt naturaliſts and philoſophers in Europe had been long employed in endeavouring to account for the exiſtence of a *golden tooth* in a living ſubject, they at length diſcovered, with wonderful ſagacity, that the tooth was a falſe one.—*Tranſlator's Note.*

† *Procellaria gigantea.* Latham.—*Tranſlator.*

obſervations

obſervations, was 155° 17′ 30″, and the latitude obſerved at noon, and reduced to the period of the obſervations for the longitude, was 19° 13′ 30″ north: according to this poſition, the eaſt point of O-WHYHEE, the largeſt and the moſt eaſtern of the SANDWICH Iſlands, muſt have borne weſt by north, at the diſtance of thirty-ſix leagues; and Captain MARCHAND might promiſe himſelf to have ſight of it the next day in the courſe of the forenoon.

He navigated during the night with the precautions required by the ſearch of land, without granting to the reſult of the aſtronomical obſervations, a degree of preciſion above that which is admitted by the method employed for determining the longitude, and allowing ſomething for the uncertainty which always remains reſpecting the eſtimate of the portion of the way that a navigator is obliged to introduce into the calculation, from the time of his laſt obſervation till he gets ſight of the land.

The next day, the 4th, at ten o'clock in the morning, O-WHYHEE was diſcovered as Captain MARCHAND had expected: it bore from weſt by north to north-weſt by weſt; and he crowded ſail in that direction.

At four o'clock in the afternoon, the ſhip was exactly under the meridian of the moſt eaſtern point of the iſland, which, according to the obſervations made on board the RESOLUTION and the DISCOVERY, in Captain COOK's third voyage *, is ſituated in 157° 10′ 15″ weſt from Paris: the longitude of the ſhip deduced from the obſervations of the preceding day, was 157° 1′: thus, the error on making the land was only 9 minutes, or ſomewhat leſs than three

* *The original aſtronomical Obſervations made in the courſe of a Voyage to the Northern Pacific Ocean, &c. By* W. Bayly. *London*, 1782. 4to. page 350.

leagues;

leagues; and it is to be obſerved that theſe 9 minutes of error may belong to the portion of the way that our navigators were obliged to eſtimate, from noon of the 3rd, to which the lunar obſervation had been reduced, to the time of taking the bearing of the eaſt point of the Iſland of O-WHYHEE*.

As for the longitude by account at the time of making the land, ſuch as it was deduced from the dead reckoning from the SOLIDE's point of departure off BERKLEY SOUND, it was found to be in error 1° 32′ 45″ or twenty-nine leagues *ahead*; but this error would have been greater by thirty-ſix minutes, or eleven leagues and one third, if the ſum of the errors *aſtern* had not balanced part of the ſum of the errors made in a contrary direction†.

In the morning of the 5th, the Iſland of O-WHYHEE, being free from the clouds which, the day before, covered a part of it, ſhewed itſelf plainly: MOWNA-ROAH and MOWNA-KAAH, two moſt remarkable mountains, ſituated in the interior of the iſland, the former and the higheſt, towards the ſouth, the latter, towards the north-eaſt quarter, were diſtinctly ſeen: but no ſnow was perceived on any of the moſt elevated points that preſented themſelves to the view. This remark does not accord with what Captain KING ſays in COOK's third voyage, that the ſummits of theſe mountains *are conſtantly buried in ſnow*‡: it appears that he was wrong to infer their habitual and conſtant ſtate, from that in which he ſaw them in the month of March, that is to ſay, at the beginning of the ſpring; it is certain that the French who ſaw them not till the beginning of the autumn, perceived no ſnow on any part of them. But, doubtleſs, in the latitude of 19° north, the ſummer ſuns muſt

* *See* Note LI. † *See* Note LI. ‡ Vol. III. page 103.

produce

produce a change, in the interval from the month of March to the month of October.

When the mountains, disengaged from clouds, were distinctly discerned from the SOLIDE, she was at the distance of five leagues from the south-east coast. In this situation, MOWNA-ROAH shews itself in a manner particularly remarkable, because its summit, which extends on an east and west line, forms a lengthened platform, in the shape of a long dining-table; and from this flat summit, its sides stretch by a gentle declivity till they meet the sea-shore.

At eleven o'clock, the ship doubled the south side of O-WHYHEE.

Towards noon, Captain MARCHAND shortened sail, in order to wait for a canoe that was steering for the ship: in it were three islanders; but they had only some fish, which was, much to their satisfaction, paid for with a nail.

The SANDWICH Islands are too well known by the voyages of COOK, PORTLOCK, DIXON, MEARES, DOUGLAS, and other English navigators who have frequented them; and LA PE'ROUSE's journal will add too many details to those which we already possess, for me to think it necessary to dwell on what concerns their soil and inhabitants: the Island of O-WHYHEE, in particular, has acquired a deplorable celebrity; it bears a spot of blood which ages will not efface*.

These islands may be considered as a large *caravansary*, placed on the route of the ships which cross the GREAT OCEAN between the parts of ASIA and AMERICA situated to the northward of the line. Several of the navigators

* It is well known that Captain *Cook* was massacred in this island.

who have made them of late years, have, through the medium of canoes, without landing, and while under ſail, procured the refreſhments, and even the water and wood, with which they wiſhed to be ſupplied. The danger incurred, a few years ago, by an Engliſh captain, who, through a concerted piece of treachery, had like to have loſt there both his crew and his veſſel, ought to render circumſpect thoſe that may be induced to preſent themſelves with ſtrength which would not be ſufficient for awing the natives or repelling an attack. We can only recommend the Europeans who frequent the GREAT OCEAN, not to anchor at theſe iſlands, but to receive from the canoes, thoſe proviſions which the iſlanders will always be eager to bring to them on board. The health of the crews has every thing to loſe, if they go on ſhore; and the natives have nothing to gain, for the preſervation of their race, by a too immediate communication with the ſeamen of civilized nations.

Captain MARCHAND formed the prudent reſolution of making all his purchaſes under ſail, and confined himſelf to trading with the Iſland of O-WHYHEE alone, which was ſufficient for all his wants. Thence he procured hogs, a ſmall quantity of poultry (fowls were ſcarce and dear), cocoa-nuts, plantains, ſweet potatoes, yams, ſugar-canes, and the other fruits and productions natural to theſe iſlands. It muſt have been an agreeable ſurpriſe, to ſee that, with the indigenous productions, were mixed pumpkins and water-melons, fruits of a ſpecies which, not belonging to the ſoil of the SANDWICH Iſlands, muſt have come from the ſeeds ſown by the Engliſh or by LA PE'ROUSE. More prudent, or leſs improvident than the inhabitants of the iſlands ſituated ſouth of the line, thoſe of the iſlands north of it have been ſenſible of what utility it would be to them to multiply this new mean of ſubſiſtence: and the Europeans, in making to the SANDWICH Iſlands this

uſeful preſent have, by an act of beneficence, ſerved their own intereſt for the future.

It was remarked that the canoes which came from O-Whyhee to traffic with the ſhip, never failed to bring women intermingled with the hogs, and offered them, conjointly with the filthy animal, among the refreſhments which the natives propoſed to the ſtrangers; however, the Solide's crew were prudent enough to content themſelves with the eatables.

Surgeon Roblet obſerves that the hogs appeared to him to be of two ſpecies: the moſt numerous and the ſmalleſt is that deſcribed by Captain Cook, and by Captain King, who continued his narrative; the only one, no doubt, with which they were acquainted: the other, leſs common, is of a large ſize; and the French obſerver is inclined to think that this is the former ſpecies, improved by a mixture with ſome European hogs. Without wiſhing preciſely to combat this opinion, I ſhall only ſay that it ſeems to me by no means probable that the Europeans have ever thought of depoſiting hogs on iſlands where they have found them ſo numerous, and where they did not arrive till after long voyages which, doubtleſs, had not allowed them to make any ſavings out of their proviſions. The ſame obſerver endeavours to deſtroy an opinion which the Engliſh voyagers appear to have eſtabliſhed, that the hogs of the Sandwich Iſlands cannot live on ſhipboard, and that, in order not to loſe them, it is neceſſary to make haſte to kill and ſalt them*: on this ſubject, he relates that, out of fifty of theſe animals which

* Captain *King* has moſt minutely deſcribed the particular method which Captain *Cook* firſt put in practice to ſucceed in ſalting pork in the countries ſituated between the tropics, where putrefaction makes its appearance ſo quickly, that vain would be the attempt to ſalt down proviſions in employing only the ordinary proceſs. Captain *Portlock* and Captain *Meares* have likewiſe explained the methods which they themſelves have practiſed with ſucceſs; theſe differ little from that of Captain *Cook*.—(See *Cook's Third Voyage*, Vol. III. pages 11 and 12—*Portlock's Voyage*, pages 88 to 90—*Meares's Voyages*, page 277.)

were

were kept alive on board of the SOLIDE, not one refused to take nourishment: and those which were not killed till after having been several days at sea, had by no means wasted away, and appeared to be in full as good condition as when they had been taken on board.

Iron is almost the only article which the natives chose to accept in exchange for their provisions. They set a great value on large spikes; but it is difficult to paint the transports of their joy, when, in the room of three or four nails, a large joiner's plane was given them as the price of one of their largest hogs: they must already know for how many uses this tool can be employed.

The passion of these people for iron is of no recent date; for it appears that on the first visit which they received from the Europeans in 1778, they were already acquainted with the utility of this metal; and they expressed the greatest eagerness to acquire it. It might thence be conjectured that the hazards of navigation, the shipwreck of some vessel coming from AMERICA and run ashore on their islands, gave them in more ancient times a knowledge of iron; and that, having experienced, by use, the superiority of this metal to hard stones, the fragments of shells, bones of animals, &c. for making tools and weapons, it is, of all European merchandise, become that which must have most excited their wishes. Surgeon ROBLET remarked, however, that, among a rather considerable number of islanders who came to traffic on board of the SOLIDE, and with whom our voyagers kept up a communication in their canoes, they saw not in the hands of any one of them, a single weapon, or implement made of iron. It would be a matter of curiosity to know for what use and how they employ those large spikes, those pieces of bar or sheet iron which they seek after with such avidity. It is not probable that they have already found out the manner of fashioning these; and although the first English ships that visited them may possibly have given them some

idea of the labours of the forge, this ſimple notion falls far ſhort of the employment of the means; a man is not a ſmith from having ſeen ſmith's work executed. If, in the ſequel, European navigators ſhould continue to perceive no weapon, no implement of iron in the poſſeſſion of the natives who come on ſhipboard, would it be too bold a conjecture to ſuppoſe that the chiefs or *Earees* of each iſland, who appear to exerciſe the greateſt authority, make it their buſineſs, either through policy, or through an effect of their cupidity, to get all the iron from the hands of the iſlanders, and form of it, as it were, hoards; as we ſee the Princes of Asia bury the precious metals which commerce with Europeans annually introduces into their country?

Before we quit the Sandwich Iſlands, I ſhall take the liberty of making a digreſſion reſpecting the period of their diſcovery by the Europeans. Thoſe who have read no other account than that of Cook's third voyage muſt believe that this diſcovery inconteſtably belongs to that celebrated navigator; but it can be proved that it belongs more anciently to the Spaniards, as well as ſeveral other diſcoveries in the Great Ocean, which ignorance or policy had ſuffered to be loſt, and which the intereſt and activity of the navigators of our days have led them to bring to light again.

I ſhall not adduce as one of the titles of the Spaniards to the firſt diſcovery of the Sandwich Iſlands, that in 1568, Mendaña diſcovered in the latitude of 19° 20′ north, and 150° weſt from the meridian of Paris, according to the Spaniſh charts, an iſland by them named San Francisco*, ſituated in the parallel of theſe iſlands; to this, the obſcurity of ancient narratives would juſtly be objected; beſides, the knowledge of an iſland in the ſame

* *Hechos de Don Garcia de Mendoça, &c. Por el. Dr. Suares de Figueroa*, p. 235.—*Herrera. Deſcrip. de las Indias Occid.* chap. 27.—*Lopes Vaz* and others.

latitude

latitude as the group of the SANDWICH Iſlands, proves not the knowledge of that very group; and it might thence merely be concluded that, in the parallel of thoſe iſlands, more to the eaſtward or more to the weſtward, there exiſt ſome other iſlands.

But I examine the Spaniſh chart of the *Manilla galleon* *; there I ſee in the parallel of the SANDWICH Iſlands, about 18° to the eaſtward of MENDAÑA's Iſland of SAN FRANCISCO, a group compoſed of four principal iſlands, and of ſome others of ſmaller extent: the moſt ſouthern is alſo the largeſt: the middle of this iſland is in the latitude of about 19° 20′; it is called LA MESA: to the north-weſt of this, are ſeen two ſomewhat conſiderable iſlands, grouped with four others much ſmaller: the ſix together are deſignated by the collective word of LOS MONJES † (the Monks): from the middle of LA MESA to the middle of the group, we may reckon about forty leagues.

Let us at preſent examine the eaſtern group of the SANDWICH Iſlands: for it is well known that theſe iſlands form two diſtinct groups; the *Weſtern* group which was explored by COOK in January 1778, in his run from the SOCIETY Iſles to the NORTH-WEST coaſt of AMERICA, and the *Eaſtern* group of which he had no knowledge till his return from that coaſt in the month of November following.

The eaſtern group is, like that of LA MESA of the Spaniards, compoſed of four principal iſlands and of a few others of leſs extent: the ſouthernmoſt iſland, O-WHYHEE, is alſo the largeſt: the moſt remarkable part of this iſland,

* *See* the two groups drawn on one plan and on the ſame ſcale. *Plate* V.

† On the copy of this map, publiſhed by Commodore *Anſon* we read *los Mojos*, in lieu of *los Monjes*; this is a miſtake; *D. Tomas Lopez*, on his *Mapa de America* 1772, writes *Los Monjes*, and it is well known that this denomination of *Los Monjes* (the Monks) is not rare on Spaniſh Maps for deſignating ſmall iſlands aſſembled in a group.

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the high mountain of Roa, is, like the middle of La Mesa of the Spaniards, ſituated nearly in the latitude of 19° 20′: to the north-weſt of O-Whyhee, as well as to the north-weſt of La Mesa, are two ſomewhat conſiderable iſlands, grouped with three other ſmaller iſlands; only, the ſmall iſlands are not here three in number; and we reckon four in the Spaniſh group: from the middle of O-Whyhee to the middle of its group, as well as from the middle of La Mesa to the middle of the group to which it belongs, we reckon forty leagues: in ſhort, both groups alike occupy from two to three degrees in latitude, and upwards of three degrees in longitude.

Thus, it is ſeen that, to deſcribe the eaſtern group of the Sandwich Iſlands, I have had only to repeat what I had ſaid in deſcribing the group of La Mesa: the ſame latitude, the ſame bearing of the iſlands with reſpect to each other, the ſame number, the ſame diſpoſition, the ſame total extent: it is not poſſible to unite more characteriſtics of identity.

To theſe geographical, and, unqueſtionably, ſufficient proofs, I ſhall add another which is not without ſome weight; but which, however, I ſhould have offered as a probability rather than as a proof, were it not ſupported by the former.

Firſt, I obſerve that the principal iſland of the group on the Spaniſh chart is called La Mesa, in Engliſh the *Table*. I obſerve, in the ſecond place, that this name of *Table* is an appellative name which navigators are accuſtomed to employ for the purpoſe of deſignating a mountain whoſe ſummit is flat: every one has heard of the *Table*-mountain, of the Cape of Good Hope; on the coaſt of Spain, in the Mediterranean, we find Orlando's Table, &c. Thus, it cannot be doubted that the Spaniards were determined to impoſe on their iſland the name of La Mesa, becauſe it was remarkable from ſome great

mountain terminated by a platform, by a *Table*. But the Iſland of O-Whyhee which anſwers, in one group, to the Iſland of La Mesa in the other, is alike remarkable, as has been ſeen, from a great mountain whoſe flat ſummit repreſents a long *table*; the natives call it Mowna-Roa, from the generic name Mowna (mountain) and from the word Roa, extended, or of a great extent. May not this ſimilitude of the two mountains, in a particularity, in a figure which is not very frequently met with, be admitted as a freſh proof of the identity of the two groups?

I am not diſpoſed to believe that it is meant to conſider the galleon's chart as not being authentic, and deſerving of no confidence; for it is well known that this chart was intruſted only to the captain of the ſhip, and it was on this chart, that, with his pilot, he regulated his courſe; and, undoubtedly, it will not be ſuppoſed that the Spaniards there placed imaginary iſlands, eſpecially when we ſee theſe iſlands deſignated by *ſignificative* names: thoſe who know the jealous uneaſineſs of the government of Spain in regard to her poſſeſſions in America, and her ancient diſcoveries in the Great Ocean, will rather be inclined to believe that they have never allowed that all the lands which her navigators have diſcovered ſhould be laid down on their charts. Theſe lands would there be improperly placed, no doubt, eſpecially in longitude; but at leaſt it would be known that they exiſt: and more ſkilful navigators would one day contrive to find them again, and bring us acquainted with them.

To the proofs which I have given of the identity of the Sandwich Iſlands and of the group of La Mesa, will be oppoſed:

1ſt. That Cook ſaw no iſland, twenty-five leagues to the north-eaſt of O-Whyhee, which can repreſent to us La Desgraciada, an iſland ſituated

on

on the galleon's chart, at that diſtance and in that bearing, in regard to La Mesa;

2nd. That Cook diſcovered to the weſt-north-weſt, and at the diſtance of twenty-five leagues from the weſternmoſt of the eaſtern group of the Sandwich Iſlands, a ſecond group, compoſed of two iſlands and two iſlots; and that the Spaniſh chart does not indicate this group.

To the firſt objection I anſwer, that, if La Desgraciada was not perceived by Captain Cook, it is not a proof that it does not exiſt. When this navigator, in coming from the ſouthward, fell in with the weſtern group of the Sandwich Iſlands, he did not even perceive the eaſtern group; ſtill leſs could he have ſeen an iſland ſituated twenty-five leagues to the north-eaſt of the latter: and when, ten months after, in returning from the northward, he looked for the group which he had viſited the preceding year, he met with the eaſtern group about the middle of its extent from north-weſt to ſouth-eaſt; he then ſailed very cloſely round the Iſland of O-Whyhee; and it is not very aſtoniſhing that he ſhould not have ſeen an iſland which, to judge of it from the name that has been impoſed on it by the Spaniards, La Desgraciadia, the iſland *unfavoured* by Nature, the *miſerable* iſland, may be a land of no great appearance, and even a low iſland. If the reader caſt his eye on the planiſphere publiſhed by Arrowsmith in 1794, and on which are marked the tracks of all the navigators in the vicinity of the Sandwich Iſlands; he will ſee no one that does not paſs too far from La Desgraciada for this iſland to have poſſibly been perceived from the ſhips which have ſteered theſe tracks. But I ſhall add that it is not proved that La Desgraciada was diſcovered by the ſame navigator who diſcovered La Mesa; and he who met with the former, could not place it according to his difference of longitude in regard to a group which he did not ſee, which perhaps he did not even know of, but

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in the abſolute longitude that he aſſigned to it according to his dead reckoning, ſince he had quitted the coaſt of AMERICA; and the galleon's chart muſt have placed it according to this abſolute longitude: now, in this caſe, it might probably happen that there was a great error in the longitude of LA DESGRACIADA, and that this iſland which, on the galleon's chart, is ſeen to differ in longitude, in regard to LA MESA, only a degree towards the eaſt, might differ from it, on the globe, ſeveral degrees in the ſame direction, and perhaps even in a contrary one. As much may be ſaid of an iſland, called ULVA, which, in the galleon's chart, is laid down in the parallel of 23° north, half a degree to the eaſtward of the meridian of LA DESGRACIADA. It is a principle which muſt be admitted, that when two iſlands have not been diſcovered by the ſame navigator, and in the ſame voyage, in paſſing from the one to the other, we can depend only on the latitude aſſigned to each iſland, that is to ſay, depend on it within half a degree; but that, in this caſe, their abſolute longitude is ſo uncertain that we cannot, if we wiſh to find them again, diſpenſe with getting into their reſpective parallel, two or three hundred leagues aſtern of the place where the chart fixes their poſition, and then navigating on this parallel till we ſucceed in meeting with the iſland*.

To the ſecond objection I anſwer, that the Spaniards who ſaw the group of LA MESA, the eaſtern group of the SANDWICH Iſlands, may very poſſibly not have ſeen the two iſlands and the two iſlots which form the weſtern group; by the ſame reaſon that COOK, (which might appear more extraordinary,) when he ſaw for the firſt time the weſtern group, did not perceive the eaſtern group, although ſome of the iſlands which compoſe it can be ſeen at the

* Here we are ſpeaking only of the diſcoveries of the ancient navigators who determined the longitudes nearly by chance; for the moderns can employ, for fixing the poſitions of the lands which they diſcover, means that give to thoſe who know how to employ ſimilar ones, the aſſurance of finding with facility the places where they wiſh to touch.

 diſtance

diſtance of forty or fifty leagues; by the ſame reaſon again, that this navigator ſaw not, thirty leagues to the north-weſt of his weſtern group, BIRD Iſland and MONTAGU Iſland*, which, ſubſequently to his laſt voyage, ſome Engliſh navigators have diſcovered: and if, as may be preſumed, the SANDWICH Iſlands are only the ſummits of a chain of ſubaqueous mountains, it might ſo happen that this chain might extend farther to the north-weſt, and form other iſlands, beyond thoſe which theſe recent navigators have diſcovered.

It ſeems to me then that the objections which, in order to do away, or at leaſt to weaken the idea of the identity of the eaſtern group of the SANDWICH Iſlands, and of that which the galleon's chart places in the ſame latitude, in the ſame number of iſlands, occupying the ſame ſpace, and diſpoſed in the ſame manner, ſhould be ſupported, on the one hand, on Captain COOK's not having perceived LA DESGRACIADA, on the other, on the Spaniards not having had a knowledge of the weſtern group of the SANDWICH Iſlands, it ſeems to me, I ſay, that theſe objections are eſtabliſhed on arguments which cannot bear a diſcuſſion.

Perhaps it will be objected to me, as a laſt reſource, that the two groups differ too much in longitude, for it to be poſſible to take them for one and the ſame group; and, in fact, O-WHYHEE, taken at its middle, is, according to the obſervations of the Engliſh, 158° weſt from PARIS, and LA MESA, on the galleon's chart, is 24° weſt from the meridian of SAN JOSEPH in CALIFORNIA†, and, conſequently, 136° weſt from that of PARIS. But this difference of 22° is far from being a proof againſt the identity of the two

* Theſe are laid down on the *General Chart of the World*, and on the Planiſphere, publiſhed by *Arrowſmith*, the former in 1790, the latter in 1794.

† The longitude of *San Joſeph*, according to the obſervations of the Abbé *Chappe*, is 112° 2′ 30″ weſt from the meridian of *Paris*. (See *Voyage en Californie*, page 85 to 88.)

groups:

groups: who does not know that, when the queſtion relates to the ancient diſcoveries in the GREAT OCEAN, we look only to the latitude which cannot be affected by a very great error; to the whole, and the general diſpoſition of the two groups that we are comparing; to the number, to the diſtances and to the reſpective bearings of the iſlands which compoſe them; in ſhort, to a union of remarkable particularities, which is not to be found the ſame in two different groups. The famous SOLOMON Iſlands, diſcovered by MENDANA in 1567, partly found again by BOUGAINVILLE in 1768, in a greater part ſtill by SURVILLE, in 1769*, viſited twice, latterly, by DENTRECASTEAUX †,

* See the *Découvertes des Français dans le Sud-eſt de la Nouvelle Guinée.*—Paris, Impr. Royale, 4to, 1790, page 85 to 100, 199 to 231.

† *France* has not, hitherto, been able to gather the fruits of the voyage which *Dentrecaſteaux* undertook in order to go in ſearch of *La Pérouſe's* frigates: but this harveſt is ſtill entire; and, no doubt, thoſe in whoſe poſſeſſion it has remained, will be ſenſible of how much importance it is to the utility of the ſciences in general, and to that of navigation and geography in particular, that the diſcoveries which he made in the courſe of a long expedition, and all the labour of his co-operators, ſhould not be loſt to a nation which bore the expenſe of it, and to *Europe*, which ought to ſhare the benefit.

Dentrecaſteaux, already fatigued by long and uninterrupted ſervices, carried with him the germ, perhaps indeſtructible, of that fatal diſorder which is with difficulty avoided by thoſe whoſe conſtitution has for a length of time been affected by long voyages, rapidly repeated, and without a neceſſary interval of repoſe: he could not withſtand freſh attacks, the violence of which was neceſſarily increaſed by a voyage of two years under the torrid zone. He ſunk, and carried with him the ſincere regret of all thoſe ſubject to his authority, which he always found means to maintain without ever ſuffering its weight to be felt. His virtues rendered him dear to his friends, and reſpected by every one who knew him, as his talents, his courage, and his experience in his profeſſion, and in the details of adminiſtration, rendered him uſeful to his country. The exceſs of his zeal ſhortened his days; but, before he terminated a career which he had ſo honourably filled, he had at leaſt the ſatisfaction of having brought the dangerous expedition, with which he was intruſted, to ſuch a point, that what remained to be done might be conſidered in the light of an ordinary voyage.

The reader, undoubtedly, will not diſapprove of Friendſhip having, by the way, ſtrewn a few flowers over the grave of a man, whoſe memory claims from his countrymen, and from navigators of all countries, a tribute of gratitude which they will be eager to pay him, as ſoon as circumſtances ſhall have allowed his labours to be reſcued from oblivion, and *Europe* ſhall be informed of what he has done, and what deſerved.

and whose geographical position is irrevocably fixed, occupied, for upwards of two centuries, on various hydrographical charts, positions in longitude, the extremes of which differed a thousand marine leagues, or about fifty degrees. QUIROS's TIERRA AUSTRAL DEL ESPIRITU SANTO, seen and explored for the first time in 1606, by the Spanish navigator of that name, and found again in 1769, by BOUGAINVILLE, long remained attached to NEW HOLLAND, of which it was presumed that it must form a part: at this day, it has retired five hundred leagues to the eastward of that vast country. When a newly-discovered group presents several incontestable characteristics of identity with another, which we know to have been seen in former times, let us beware of saying that it is not the same group, from the sole reason that it was found in a longitude different from that which the first *discoverer* had indicated only from the erroneous distance at which he supposed it to be from the continent of AMERICA, whence he had been dispatched. And such has been the fate of part of the insulated discoveries of the Spaniards: daring adventurers, bold in trying fortune and chances, lucky in their course, ignorant in tracing it, satisfied, in short, with having discovered half of the globe, they have left to others the task of finding again what they themselves seemed to have forgotten.

In depriving Captain COOK of the barren honour of the first discovery of the SANDWICH Islands, I deprive him not of the smallest portion of that fame which he has so justly acquired: I will even say that it is adding, if possible, to his merit; for merit consists in finding what we look for, in having combined the means that might lead to the discovery; and to discover what we were not looking for, is the merit of chance, which ought not justly to be assigned to the share of the navigator whom chance has favoured; it is a borrowed merit; and Captain COOK, so rich in his own discoveries, ought to borrow nothing, as he can have nothing to envy in the adventurers to whom

whom we are, before his time, indebted for the ſhapeleſs knowledge of the globe. If diſcoveries immortalize thoſe who have made them, they alſo immortalize thoſe who have brought them to perfection.

Lieutenant Roberts, who conſtructed the general chart of the third voyage of the Engliſh navigator, on which are traced his three Voyages round the World, and towards both poles, has preſerved the group of La Mesa of the galleon's chart, and placed it, taken at its middle, 19° eaſt from O-Whyhee and on the parallel of that iſland: it ſhould ſeem that, in thus preſerving the group diſcovered by the Spaniards, he was deſirous that no one ſhould dare to conteſt with the Engliſh the firſt diſcovery of the Sandwich Iſlands. But Arrowsmith, both on his General Chart of 1790, and on his Planiſphere of 1794, ſacrificing, no doubt, national vanity to evidence, has done juſtice to this double adoption. As far back as 1786, La Pe'rouse who, with a view of aſcertaining whether there exiſted any iſlands to the eaſtward of the Sandwich group, had made a point of running, in their parallel, three hundred leagues from eaſt to weſt, neither perceived, over this whole ſpace, any detached iſland, nor ſaw any ſign of land; though from the aſpect of the Iſland of O-Whyhee, and its *table*-mountain, he had no doubt of its being La Mesa of the Spaniards.

But in effacing the group to which La Mesa belongs, and which becomes the eaſtern group of the Sandwich Iſlands, Arrowsmith has alſo totally effaced the Iſland of Roca-Partida, ſituated, on the galleon's chart, about one hundred and forty leagues to the eaſt-ſouth-eaſt of La Mesa, and on a parallel leſs northerly by three degrees and a half: he has merely ſuffered La Nublada to ſubſiſt, whoſe name indicates a high land, over which clouds hang; and it is laid down a hundred leagues to the eaſtward and on the parallel of Roca-Partida. This laſt-mentioned iſland was diſcovered, in

1542,

1542, by the Castilian pilot JUAN GAETANO, in the first voyage that the Spaniards ever attempted, from the west coast of NEW SPAIN to the great archipelago of ASIA. Before he had reached ROCA-PARTIDA, GAETANO had discovered, on the same parallel, and two hundred leagues to the eastward, according to his reckoning, another island which he had called SAN TOMAS*. This island, situated to the eastward of ROCA-PARTIDA, and which bears no name on the galleon's chart, might be that which the modern charts designate by the name of LA NUBLADA. We are not justified in supposing that LA NUBLADA, or GAETANO's SAN TOMAS, are one and the same island, since the Spanish navigator discovered them successively, in the same voyage, in standing from the eastward to the westward, and imposed on them different names.

Hitherto, neither ROCA-PARTIDA nor SAN TOMAS, or LA NUBLADA, have been found again; but let us not be in a hurry to efface them from our charts: let us not forget that the SOLOMON Islands had thence disappeared, since some geographers, supporting themselves on the opinion of the learned ALEXANDER DALRYMPLE, had supposed that these islands must be the east part of NEW GUINEA: and at this day, the archipelago of the SOLOMON Islands occupies its particular place on the globe, over an extent of two hundred leagues, forty leagues to the south-east of that NEW GUINEA, with which it was wished to be confounded†. Let us suffer all the islands to subsist which the Spaniards have pointed out to us on their charts or in their narratives, till we have well ascertained their identity with others;

* See *Ramusio. Delle Navigationi e Viaggi, &c. Venetia, Giunti.* 1563. Vol. I. fol. 375, *verso.*

† See the *Découvertes des Français dans le Sud-est de la Nouvelle Guinée,* page 4 to 19—85 to 154—201 to 231—The voyage of *Dentrecasteaux* has confirmed what was there said of these islands.

let

let us preſerve them, were it only as *beacons*, which attract the attention of the navigator, and engage him to make reſearches.

I ſhall terminate this digreſſion, rather long perhaps, but which, however, is not void of utility, by obſerving that chronological accuracy, hiſtorical truth, and juſtice, alike require that in placing the SANDWICH Iſlands on the map of the globe, they ſhould no longer be laid down with the erroneous indication of *iſlands diſcovered by Captain* COOK. There might be written above this archipelago: SANDWICH *Iſlands, explored and named by Captain* COOK *in* 1778; *formerly diſcovered by the Spaniſh navigators:* this would be to declare what belongs to the moderns, and at the ſame time to reſtore to the ancients what they have a right to claim.

I return to the journal of Captain MARCHAND.

He took his departure from the Iſland of O-WHYHEE, on the afternoon of the 7th of October, and ſhaped his courſe for CHINA.

O-WHYHEE and MOWEE, the two eaſternmoſt iſlands of the eaſtern group of the SANDWICH Iſlands, both appear particularly remarkable from mountains of the greateſt elevation. In order to eſtimate, by approximation, the height of their ſummits above the level of the ſea, I ſhall make uſe of the greateſt diſtances at which theſe mountains were perceived from the SOLIDE, diſtances calculated from the way that the ſhip had made in ſight of the land, and rectified by the obſervation of the latitude.

We find by Captain CHANAL's journal, that on the 9th at ſix o'clock in the morning, he ſet, at the ſame time, the mountain of the Iſland of MOWEE bearing north-eaſt 2 or 3° eaſt, and that of MOWNA-ROAH of the

Iſland of O-Whyhee, eaſt by north 2 or 3° eaſt: he reckoned that the ſhip was then at the diſtance of thirty-ſix leagues from both of them. At half paſt five o'clock in the afternoon, he ſtill perceived very diſtinctly the ſummit of Mowna-Roa, bearing eaſt 2° 30′ north, although he was forty-ſix leagues diſtant from the weſt coaſt of the iſland, and, conſequently, about fifty leagues from the ſummit of the mountain.

If, with this diſtance of fifty leagues, and regard being had to the depreſſion of the horizon and the effect of terreſtrial refraction, it be wiſhed to ſeek by calculation, what muſt be the height of the ſummit of Mowna-Roa, in order to be perceived at the diſtance of fifty leagues, it will be found that it is 2598 toiſes, and thence it will be concluded that, next to Chimboraço in Peru whoſe height is 3220 toiſes, Mowna-Roa is the higheſt mountain on the globe: for Pinchincha which occupied the ſecond place, is but 2434 toiſes; Mount Blanc which occupied the third, 2391; and the Peak of Teyde or Teneriffe, which occupied the fourth, 1905 toiſes only, according to the trigonometrical and barometrical calculations of Borda*. Mowna-Roa is therefore loftier than the Peak of Teneriffe, by 694 toiſes; and this reſult would ſeem to confirm that given by Captain King in the third volume of Cook's laſt voyage: he ſays that "this mountain muſt be at leaſt 16,020 feet high, which exceeds the height of the "Pico de Teyde or Peak of Teneriffe, by 724 feet, according to Dr. "Heberden's computation, or 3680 Engliſh feet or 3452 French feet, according to that of the *Chevalier de* Borda†," which gives $575\frac{1}{2}$ toiſes leſs; this differs, in defect, only $19\frac{1}{2}$ toiſes, from the height that I have deduced from the *data* furniſhed me by Captain Chanal's journal.

* *See* Note II.

† *Cook's third Voyage*, Vol. III. pages 103 and 104.

But

But Captain KING obtained his result by a method different from that which I employed to arrive at mine: he took for the basis of his calculation, according to the principle adopted by LA CONDAMINE for measuring the heights of the ANDES or CORDILLERAS, the elevation of the line at which the snow remains all the year on the high mountains between the tropics. This method was not applicable to the mountains of the SANDWICH Islands, since it has been seen that, in the month of October, there existed no snow on any part of these islands. I therefore consider it as the effect of chance that KING's result and mine agree, within a trifling difference. I observe that KING, still following the principle which he adopted, adds that the height of MOWNA-ROA must be much greater than that which he assigns to it; for, says he, "in insular situations, the effects of the warm sea-air "must necessarily remove the line of snow, in equal latitudes, to a greater "height than where the atmosphere is chilled on all sides by an immense "tract of perpetual snow." The principle is true, and the application of it would be just, if it had for its object islands where the snow should last the whole year; but it cannot be admitted with respect to those where the snow does not resist the summer suns*.

* In not adopting the consequence which Captain *King* has drawn from the principle on which he rests for deciding that the height of *Mowna-Roa* must be much greater than that which he determines, and which is, within a trifling difference, the same as that I have deduced from the distance at which its flat summit was very clearly distinguished from the *Solide*, I am far from pronouncing that the height of the mountain, does not exceed the 2598 toises given me by calculation; for Captain *Chanal* related to me verbally that, on the 10th at sun-rise, several persons belonging to the ship were convinced that they still perceived the Table of *Mowna-Roa* in a line with the horizon; and, at this period, according to the run which had been made during the night, the *Solide* must have been fifty-three leagues distant from it at least; which would give to the mountain upwards of 2700 toises in elevation above the level of the sea.

Captain *Chanal* had not thought it necessary to insert this observation in his journal, because he had not been able to see with his own eyes; but he told me that, on other occasions, he had discovered that several of the people had a sight which extended much farther than his.

The ſame obſerver eſtimates, according to his method, the height of Mowna-Kaa, (the northern mountain of the Iſland of O-Whyhee) at half a mile or 475 toiſes; and he adds, that this computation muſt be too low, for the ſame reaſon that he has given for ſuppoſing too ſmall the eſtimation which he has made of Mowna-Roa. Captain Chanal's journal affords us no *datum* for determining the elevation of Mowna-Kaa, but Surgeon Roblet thinks that the eſtimation which Captain King ſuppoſes to be too low, is, on the contrary, very much exaggerated.

In order to find the height of the mountain of Mowee, the ſecond iſland of the eaſtern group, we ſhall calculate according to the diſtance of thirty-ſix leagues, eſtimated by the eye, at which it was perceived on the morning of the 9th; and it will be found that its ſummit is 1346 toiſes high: this height is between that of Mount St. Gothard, 1431, and that of the convent on the Great St. Bernard, 1241 toiſes.

The Iſland of Atooi, the weſternmoſt of the weſtern group, is alſo very loſty; for, on the 10th, at noon, it bore north-north-weſt 3 or 4° north; and, according to the latitude of the ſhip obſerved at the ſame inſtant, and compared with the known latitude of the iſland, the diſtance from the ſhip to Atooi muſt have been thirty leagues: the height of the mountain is therefore 1216 toiſes.

In the interval from noon on the 9th to noon on the 10th, the ſhip had experienced the effect of a violent current, which had carried her 29 minutes, or nine leagues and two thirds to the northward, as was aſcertained by comparing the difference of the latitudes obſerved on the 9th and 10th, with the difference deduced from the dead reckoning during the ſame twenty-four hours. Captain Marchand had conſtantly ſteered weſt-north-weſt

3° 45′ north, allowing for the variation; the wind had blown very faintly and unsteadily from the southward during the first five hours; in the night, it had been calm; and, from two o'clock in the morning till noon on the 10th, the wind had stood in the north-east quarter, very faint and baffling; the ship had made very little way through the water: it may therefore be supposed that, as she was abreast of all the channels that separate both the two groups, and the islands of which they are composed, the rapid current which, no doubt, these channels occasion, had acted with all its velocity and strength against the ship whose route crossed its direction; and, by causing her to drift bodily to the northward, although her apparent route was west-north-west, it had carried her ten leagues in twenty-four in the former direction.

On the 11th, at break of day, no land was to be seen.

The run across the GREAT OCEAN with regular and steady winds, presents only a monotonous series of remarks relative to the velocity and the direction of the currents, and their influence on the ship's course: I have thought it my duty to throw them into the *NOTES*; and I invite the nautical reader to consult them*

Captain MARCHAND's intention had at first been to steer between the twentieth and twenty-first parallel north, and to follow this direction as far as CHINA. This track, little frequented, and which afforded the hope of some discovery, is, undoubtedly the most direct, and may, at the first glance, appear the shortest; but he was justly apprehensive, (and the calms which he had recently met with strengthened this apprehension) of finding

* *See* Notes LII to LV.

only faint and variable breezes, if he perſiſted in keeping on the border of the trade-winds; he therefore determined to penetrate farther into the region which they occupy, and he kept between the thirteenth and fourteenth degree of north latitude, crowding ſail, till, on the 2nd of November, he had reached the longitude of 148° 14′ eaſt from the meridian of PARIS*. He then ſtood again a little to the northward, and got nearly into the latitude of 15°, which is the parallel of TINIAN, one of the iſlands that compoſe the MARY-ANNE Archipelago, which he purpoſed to make, in order to croſs it between this iſland and that of SAYPAN.

This longitude of 148° 14′ on the 2nd, was the mean reſult of four ſets of diſtances from the moon to the ſun, obſerved at half paſt two o'clock in the afternoon, by Captain MARCHAND and Captain CHANAL, and reduced to noon.

In allowing for the ſhip's progreſs by account towards the weſt, in the interval from the 2nd to the 3d, it was computed that at noon of the latter day, ſhe had reached the longitude of 146° 7′ eaſt from PARIS, at the ſame time that ſhe was in 15° 6′ north latitude.

The obſervations of Captain WALLIS on board the DOLPHIN, in 1767, place the Iſland of TINIAN, in 143° 35′ 45″†; thus, at noon, the SOLIDE muſt have been at no more than 2° 31′ 15″ to the eaſtward of this iſland; and at ſun-ſet, Captain MARCHAND reckoned that he was only at the diſtance of thirty-ſix leagues from it.

* *See* Note LVI. and the *Journal of the Route* at the date of the 2nd of November.

† See *Aſtronomical Obſervations made in the Voyages for making Diſcoveries in the Southern Hemiſphere.* By W. Wales, *London*, 1788. 4to. INTRODUCTION, page X.

He

He regulated his ſail ſo as to diſcover the iſland the next morning, and ſufficiently early for him to hope to croſs the archipelago during the day: but all night there was tempeſtuous weather, with rain and ſqualls.

It was not till three o'clock in the afternoon that he got ſight of the iſland; and, in eſtimating his diſtance from it by the eye, he judged it perfectly conformable to the reſult of the obſervations which had been made on the preceding days.

At three quarters paſt five, the mean reſult of two ſets of diſtances of the ſun and moon, combined with that of four other ſets obſerved on the 2nd, gave 143° 38′ for the eaſt longitude of the ſhip, which places the eaſtern extremity of TINIAN, according to the bearing that was taken of it at the ſame inſtant and its eſtimated diſtance, in 143° 33′: it has been ſeen that the obſervations of WALLIS placed it in 143° 35′ 45″: thus the obſervations made on board the DOLPHIN and thoſe made on board the SOLIDE agree in their reſults, and this agreement may be conſidered as the proof of a ſufficient accuracy in this determination*.

Captain THOMAS GILBERT places TINIAN in 146° eaſt from GREENWICH, or 143° 39′ 45″ eaſt from PARIS†; but he does not mention on what obſervations he has founded the poſition which he aſſigns to it: DIXON gives it only 143° 10′‡.

As for the latitude of TINIAN, Captain MARCHAND was not enabled to obſerve it immediately; but GILBERT has concluded from his obſervations,

* *See* Note LVII.

† *Voyage from New South Wales to Canton in the year* 1788. *By Thomas Gilbert, commander of the Charlotte. London,* 1789. 4to. page 63.

‡ *Dixon's Voyage,* page 284.

that

that the middle of the iſland is ſituated in 15°. Captain WALLIS fixed the point of the road where he was at anchor, and which is leſs northerly than the middle of the iſland, at 14° 55′, and the watering-place which is not far diſtant from the ſouth-weſt point, at 14° 59′*. DIXON places the iſland, in general, in 15° †. All theſe poſitions agree with each other.

This is not the caſe with the latitude which Commodore ANSON had aſſigned to this iſland: he places it in 15° 8′ ‡: but although, at the period when the obſervation was made, HADLEY's quadrant had for ten years been in uſe in the Engliſh navy, and although it was undoubtedly employed on board ANSON's ſhip, I do not think that any regard ought to be paid to this determination; and the middle of the iſland may be fixed in 15° north. This difference between the latitudes determined by ANSON, and thoſe obſerved by recent navigators, is again to be found nearly the ſame in regard to SAYPAN. The Commodore's journal places this iſland, without any other indication than its name, in 15° 22′: we are juſtified in believing that this latitude applies to the PEAK, the moſt remarkable part of the iſland; and, in this caſe, it would differ by 9 minutes from that given by the obſervations made on board the SOLIDE, according to which this mountain muſt be ſituated in 15° 13′: but if the former determination was applied to the northern point of SAYPAN, it differed only by 2 or 3 minutes from the reſult of the later obſervations, which, as will be ſeen, place this point in 15° 19 or 20′.

At ſix o'clock in the evening, the SOLIDE was at the opening of the paſſage, through which a ſhip may croſs this archipelago between this iſland and that

* *Hawkeſworth's Compilation.* Vol. I. page 500.

† *Dixon's Voyage,* page 284.

‡ *A Voyage round the World in the years* 1740-41-42-43 and 44. *By George Anſon. Compiled by Richard Walter.* The 12th Edition. London. 4to. 1767. page 308.

of

of TINIAN; but it would not have been prudent to enter it at the moment when the day was on the point of closing, and Captain MARCHAND determined to stand to the offing during the night. He had reason to congratulate himself on the resolution that he had taken; for he met with frequent puffs of wind, and some very hard squalls, which might have occasioned him embarrassment and uneasiness, had the ship been engaged among lands, and there obliged to alter her course according to the changes of the wind.

On the 5th, at the first dawn of day, he again stood in for the land.

At three quarters past six, the passage between the islands bore west-south-west 6° west, distant about six leagues: and although Captain MARCHAND carried a press of sail, the ship drifted to the northward so considerably, that he had no hopes of being able to clear the passage with the wind which blew from the south-south-east and south by east. At half past seven o'clock, he bore up north-west by west in order to pass to the northward of SAYPAN. He ranged along the north-east coast of this island at the distance of about wo leagues. At three quarters past eight, its north-east point, which is the most northern extremity, bore west 2° south, distant two leagues: no land was perceived to the northward. Before ten o'clock, was discovered, on the west coast of the island, an islot which bore south-west 6° west in one with the north point of SAYPAN. At noon, this point bore south-east by south 1° south, and at a distance of about four leagues; the west extremity of the island, south by east 1 or 2° south; and the islot, south by east 6° south.

The latitude observed at the same instant was 15° 30′; and thence the northern point of SAYPAN was found to be in 15° 19 or 20′. The peak of this island is situated, nearly, in latitude 15° 13′, and in about 143° 30′ east longitude.

In

In comparing the latitude obſerved at noon, with that which reſulted from the dead reckoning during the preceding twenty-four hours, it was diſcovered, that, in this interval of time, the currents had carried the ſhip 17 minutes, or five leagues and two thirds, to the northward*.

Ships which croſs the Archipelago of the MARY-ANNE Iſlands are accuſtomed to paſs between SAYPAN and TINIAN, or to the ſouthward of the latter iſland: theſe two paſſages are the moſt frequented, becauſe they are the beſt known. Circumſtances, as has been ſeen, forced the SOLIDE to paſs to the northward of SAYPAN; and Captain CHANAL thinks, from the remarks which he was enabled to make, that, in all caſes, this laſt-mentioned paſſage would deſerve to be preferred to the other two, when it is not intended to touch at TINIAN. He ſaw no iſland, no ſhoal, to the northward of the northern part of SAYPAN: the charts, indeed, indicate, under the name of FARELLON, a ledge or ſhoal, ſituated in the latitude of 16°, under the very meridian of the iſland; but it is there placed at the diſtance of twelve leagues from its northern point. Off the north-eaſt coaſt, and the north point, are a few breakers; but they ſhew themſelves, and do not extend a mile into the offing. A ſhip may double the iſland to the northward, and range along its coaſt with ſafety, leaving, between the land and her, a diſtance of one or two leagues.

The Iſland of SAYPAN, uninhabited like that of TINIAN, ſeems not, as far as a judgment can be formed from coaſting its north ſide, to afford the ſame refreſhments to ſhips that ſhould touch there: only, among the trees with which the north-eaſt coaſt is covered, are diſtinguiſhed a great quantity of cocoa-palms.

* *See* the *Journal of the Route* at the date of the 5th of November.

Commodore

Commodore ANSON, who has given us a view of the north-weſt coaſt of the iſland, ſays that it preſents not a leſs agreeable aſpect than that of TINIAN.

In 1765, Commodore BYRON cauſed the Iſland of SAYPAN to be viſited; and this is the only deſcription of any length that we have of it: the nation which poſſeſſes it, without occupying it, is not in the habit of deſcribing its poſſeſſions. According to him, SAYPAN is conſiderably larger than TINIAN, and, in his opinion, has a much pleaſanter appearance. But this ſentiment is peculiar to BYRON; and voyagers, in general, agree in giving TINIAN the preference to SAYPAN, both in regard to extent and beauty: the Spaniards have denominated it BUENA-VISTA by way of excellence. The TAMAR (the ſhip which BYRON ſent to examine the Iſland of SAYPAN, while he himſelf lay at TINIAN), anchored, he ſays, "to leeward of it, in about ten fathoms water, with much the ſame kind of ground (hard ſand and coral rock) as he had in the road of TINIAN. Her people landed upon a fine ſandy beach which is ſix or ſeven miles long, and walked up into the woods, where they ſaw many trees which were very fit for topmaſts. They ſaw no fowls, nor any tracks of cattle; but of hogs and guanacoes* there was plenty. They

* The Guanaco or *Huanacu* is the wild animal that takes the name of *Llama*, when it is in a ſtate of domeſticity*. This quadruped originally came from the high mountains of *South America*, and is very common in *Peru*, where it performs the ſame functions as the pack-horſe in *Europe*, and the camel in *Africa*. The fleſh of the young guanacoes is good eating. It is aſtoniſhing that this animal ſhould be found on the Iſland of *Saypan*; it certainly is not indigenous there; and it muſt be ſuppoſed that the Spaniards have tranſported it thither from *Peru*, in order to try to propagate the breed. Hitherto, *Byron* is the only one who has ſeen any of the ſpecies in the *Mary-Anne* Iſlands; at leaſt no other voyager makes mention of it; nor is it ſpoken of in any deſcription of the Iſland of *Tinian*; but if the Spaniards wiſhed to try to naturalize it in the *Mary-Anne* Iſlands, they muſt have preferred making a trial on *Saypan*, the lands of which, more elevated than thoſe of *Tinian*, muſt be better ſuited to the guanaco.

* This ſpecies reſembles the Glama in many particulars of its external form; but theſe animals never intermix, either in the wild or domeſticated ſtate: beſides this, the *Camelus huanacus* wants the protuberance on the breaſt peculiar to the *Camelus glama*; it has a bunch on the back, which the former animal has not; and its hind legs are likewiſe conſiderably ſhorter in proportion; whence its gait is a kind of bounding or hobbling.—*Tranſlator.*

 found

found no freſh water near the beach, but ſaw a large pond inland, which they did not examine. They ſaw large heaps of pearl oyſter-ſhells thrown up together, and other ſigns of people having been there not long before: poſſibly the Spaniards," adds he, "may go thither at ſome ſeaſons of the year, and carry on a pearl-fiſhery: they alſo ſaw many of thoſe ſquare pyramidal pillars which are to be found at TINIAN, and which are particularly deſcribed in the account of Lord ANSON's voyage *."

Captain PORTLOCK, who has given us a view of SAYPAN, ſays that, although he coaſted it within the diſtance of half a mile, he could not obſerve on it an animal of any kind †.

At the firſt ſight of the Iſlands of TINIAN and SAYPAN, and eſpecially at the aſpect of the former, Captain MARCHAND might have been tempted to land on it: the ſeaſon was favourable for his anchoring there; and he might hope to procure ſome of the refreſhments which a long navigation under the torrid zone occaſions to be ſo ardently wiſhed for by men overwhelmed by the exceſs of a conſtant heat, and for a long time paſt condemned to privations. But theſe privations and the fatigues of the ſea had not impaired the good health which his ſhip's company had enjoyed during the whole voyage; and the intereſt of the expedition and of the owners required that he ſhould know how to ſacrifice a few tranſitory enjoyments to the inappreciable advantage of getting the ſtart, if poſſible, in the markets of CHINA, of the ſhips of other nations which, like the SOLIDE, were to bring thither furs from the NORTH-WEST coaſt of AMERICA. The crew murmured not in the leaſt at a deciſion, the motives of which were known to them; they even abſtained from manifeſting any regret, that they might not add to that which their commander felt for others, much more than for himſelf.

* *Hawkeſworth's Compilation.* Vol. I. page 121. † *Portlock's Voyage*, page 317.

While

While the SOLIDE is making the beſt of her way towards the continent of ASIA, let us fix our eyes for a moment on the Iſland of TINIAN, without giving ourſelves up to a particular inſpection of the other iſlands that compoſe the long Archipelago of LOS LADRONES (the Thieves), to which it belongs, and which form a chain of two hundred leagues under the hundred and forty-fourth meridian eaſt from PARIS, between the eleventh and the twenty-firſt parallel NORTH.

MAGELLAN, who diſcovered this archipelago in 1521, impoſed on it the name of ISLAS DE LOS LADRONES; becauſe the inhabitants of theſe iſlands, who had no idea of the excluſive right of property, fraternally appropriated to themſelves, on board his ſhip, every thing that came in their way: but, at this rate, that name might be generic and common to all the iſlands of the GREAT OCEAN. In the ſequel, the LADRONE Iſlands received the name of ISLAS DE LAS VELAS, from the great number of ſailing-craft which came from theſe iſlands to meet ſhips, when they preſented themſelves there for the purpoſe of anchoring. Laſtly, towards the middle of the ſeventeenth century, they changed their new name for that of the MARY-ANNE Iſlands, in honour of MARY-ANNE of AUSTRIA, wife of PHILIP IV.

In 1564, or, according to ſome hiſtorians, in 1565, ANDREAS MIGUEL LOPES LEGASPI took poſſeſſion of theſe iſlands in the name of the crown of SPAIN; but he made a ſhort ſtay there, becauſe he neither found the conveniences that he could deſire for a ſettlement, nor the riches that could gratify his cupidity. He employed, to more advantage, the forces which he commanded, in the conqueſt of LAS PHILIPPINAS, the iſlands named the Archipelago of SAN LAZARO* by MAGELLAN, who diſcovered them in con-

* This name was given them becauſe *Magellan* made the diſcovery of them, and landed on them on the Saturday that preceded *Paſſion*-Sunday, a day which the Spaniards keep as a feſtival in honour of *St. Lazarus*.

tinuing his route towards the eaſt, after having croſſed his archipelago of Los LADRONES. It is well known that it was in one of theſe iſlands that MAGELLAN, a Portugueſe by birth*, then employed in the ſervice of SPAIN, loſt his life, in wiſhing to favour, by the help of his arms, the projects of conqueſt of the ſovereign of one of theſe iſlands, at war with the ſovereign of a neighbouring iſland, both of whom were one day to paſs, together with their country, under the domination of another ſovereign who, at the diſtance of ſix thouſand leagues, and without concerning himſelf about them, was to add their iſlands to his vaſt domains. The importance of the PHILIPPINES had required that the Spaniards ſhould make it their buſineſs to get poſſeſſion of them, before they thought of the MARY-ANNE Iſlands: after having terminated the conqueſt of the former, they formed there various ſettlements; and particularly that of MANILLA, in the Iſland of LUCONIA, with which NEW SPAIN, ſubdued by the arms, or rather by the genius of CORTES, forty-five years before, opened and maintained habitual communications.

The Iſlands of Los LADRONES remained forgotten (and it were to be wiſhed for the ſake of their inhabitants that they had always been ſo!) till the zeal of a celebrated Jeſuit, SANTIVORES, intereſted the devotion of Queen MARY-ANNE of AUSTRIA, regent during the minority of her ſon CHARLES II. and excited her to cauſe the Gopſel to be carried into theſe iſlands, which MAGELLAN had found means to annex to the ſhare of SPAIN, by diſcovering a new route, that eluded that ridiculous *line of demarcation* by which a pope pretended to cut the earth in two, in order to divide

* The real name of this celebrated Portugueſe navigator, employed in the ſervice of *Spain* when he diſcovered the ſtrait which bears his name, is *Fernando de MAGALHAENS*, of which the Spaniards who wiſhed to naturalize him as a Spaniard, made *Hernando* MAGALLANES, and of which the French who wiſh always to tranſlate and who often burleſque proper names, have contrived to make MAGELLAN.

between

between two ſovereigns of EUROPE the excluſive poſſeſſion of all the new countries that ſhould be diſcovered in the two Worlds.

In 1688, the Spaniards preſented themſelves at the MARY-ANNE Iſlands, with the croſs in one hand, and the ſword in the other; and with theſe two weapons, which lent each other mutual aid, their pretended right to the poſſeſſion of theſe iſlands could not fail to be acknowledged. They had no difficulty in making themſelves maſters of GUAHAN or GUAHAM, (and GUAM by corruption) the principal of theſe iſlands, and the moſt ſouthern of the archipelago *; and, by degrees, they ſubdued all the others.

Our knowledge of the MARY-ANNE Iſlands was derived only from the Spaniſh hiſtorians †, and this knowledge was very imperfect; ſome of them loſt nothing by not being better known; but TINIAN deſerved to be particularly deſcribed, becauſe the uſurpers of the archipelago not having eſtabliſhed themſelves there, and this iſland being recommendable on account of its fertility, it might afford valuable reſources to ſhips croſſing the GREAT OCEAN between the tropics, from eaſt to weſt.

We are indebted to RICHARD WALTER, chaplain to Commodore ANSON, in his voyage round the world, for the firſt account that has deſerved the attention of navigators ‡. The Commodore ſeeking an aſylum for his ſhip,

* This archipelago is compoſed of nine principal iſlands: *Guahan*, the moſt conſiderable and the moſt ſouthern, is ſituated in latitude 13° at its ſouth point; but to the ſouthward of this iſland, alſo lie ſeveral iſlots and rocks, the laſt of which extends no lower than the eleventh parallel North.

† *Ant. de Herrera, Decad.* 3, Lib. 7. et ſeq.—*Argenſola Conquiſta de las iſlas Malucas*, Lib 1.—*Gonzales de Oviedo. Hiſt. nat. de las Indias*—*Gomara Hiſt. gen. de las Indias*—*Ultimo Viage al Eſtrecho de Magalhanes*, &c. page 205 *et alibi.*

‡ *A Voyage Round the World in the years* 1740, 1741, 1742, 1743, *and* 1744, Book III. Chap. II.

which might be called a floating hospital, made TINIAN, on the 27th of October 1742, and anchored in an open bay, situated at its south-west point: here he provided without difficulty, without expense, and abundantly, for all the wants of the CENTURION: here her crew recovered quickly from their fatigues: the disorder which, the very day before her arrival, was carrying off upwards of twenty men a day, ceased, as by a miracle; and, in less than a week, the worst of the sick were so far recovered, as to be able to walk without assistance.

It was natural to celebrate an island to which so great a number of seamen had owed their lives, to extol the quality of its animals, the richness of its productions, the variety of its sites, the beauty of its walks, the salubrity of its air, every thing that could operate a sort of resurrection: and, indeed, ANSON's historian has painted to us TINIAN as the garden of EDEN realized. But, if it may be suspected that gratitude has indulged itself in exaggerating a little the excellence of this land of promise, at least there can be no doubt of the ocular historian having reported, with exactness, facts concerning which, had his narrative been unfaithful, five hundred witnesses, also ocular, might have contradicted him: and the comparison of what TINIAN was in ANSON's time, with what it is at this day, presents one of those astonishing contrasts which the philosopher cannot see with indifference, and without tracing back the effect to its cause.

Commodore ANSON, who gives to this island twelve miles in length by six in breadth, found it uninhabited at the period when he put in there (1742); but assiduous culture, regular plantations, fruit-trees in great number and variety, monuments still standing and disposed in symmetrical order, the labour of man shewing itself every where to aid or embellish Nature; all things announced that, at a period which must not have been remote,

remote, a numerous population had covered a land that presented to the human race so many means of subsistence, so much facility for multiplying their species. TINIAN, in fact, in a more happy time, had been very populous, in proportion to its extent, and for the honour of its new masters, we would wish to refuse our belief to the motive which has completed its ruin. ANSON learnt from a Spanish serjeant and some Indians, whom he had made prisoners in a *proa* *, of which his boat took possession on going on shore, that, fifty years before, the Island of TINIAN reckoned upwards of thirty thousand inhabitants; and that, at that time, an epidemical disorder having carried off the greater part of the inhabitants of the MARY-ANNE Islands, the barbarous policy of the usurpers turned over to the Island of GUAHAN, where they were settled, all the Indians whom the mortality had spared in TINIAN: it unmercifully tore from a land, covered with the bones of their fathers, brothers, wives, children, and friends, unfortunate beings who had the mortification to survive their extinct families; it condemned them to water, with the sweat of their brow, a foreign soil. But cupidity was disappointed in its calculations; and these deplorable relics of TINIAN, with their eyes incessantly fixed on their native shore, died in

* A *Proa*, which Europeans call also a *flying-proa*, is a small sailing-vessel, remarkable for its astonishing lightness, and the prodigious velocity of its movement, which that of no other vessel can equal, and which is asserted to be frequently twenty miles an hour. The ingenious construction of the *proa* must give a great idea of the intelligence and industry of the ancient inhabitants of the *Mary-Anne* Islands, who are the inventors of it. We find, indeed, in several of the islands of the great archipelago of *Asia* and on parts of that continent, some vessels which bear a faint resemblance to the *proa*; but we know of none that can be compared to it for the simplicity of its construction, the swiftness of its sailing, the celerity with which it is managed, and the readiness of its evolutions; and it may be justly said, that the *proa* is the *prototype* that has served for other craft of the seas of *Asia*, which are only the imperfect copy of the most perfect model. A very minute description of a *proa* of the *Mary-Anne* Islands, with all the plans reduced to a common scale, which can make known its dimensions, structure, and rigging, is to be seen in *Anson's* voyage, Book III. Chap. V.

despair.

deſpair. Was it then reſerved for a nation of EUROPE, for a civilized nation, to be the ſcourge of the two Worlds? In the New, they exterminate the human ſpecies, in order to tear, from the bowels of the earth, metals, the object of all their wiſhes, which Nature had wiſely buried! And in the parts of the Old World, which remoteneſs has not been able to conceal from their yoke, they degrade the human ſpecies to ſuch a degree, as to drive men from domain to domain, as the farmer pens up his cattle on lands which he wiſhes to manure!

The deſpair of the inhabitants of TINIAN will appear natural to every man who loves his country: and what a country is TINIAN, if, in fact, RICHARD WALTER has given us a faithful picture of this iſland! It is he himſelf who is going to ſpeak: I will not weaken his deſcription: I merely reſerve to myſelf the liberty of extracting and abridging, without confining myſelf always to an uninterrupted tranſcript; but I ſhall not take the liberty of making any change that can affect the reſemblance.

"The ſoil of the Iſland of TINIAN," ſays WALTER, "is every where dry and healthy, and being withal ſomewhat ſandy, it is thereby the leſs diſpoſed to a rank and over-luxuriant vegetation; and hence the meadows and the bottom of the woods are much neater and ſmoother than is cuſtomary in hot climates. The land roſe in gentle ſlopes from the very beach where we watered, to the middle of the iſland, though the general courſe of its aſcent was often interrupted by vallies of an eaſy deſcent, many of which wind irregularly through the country. Theſe vallies and the gradual ſwellings of the ground, which their different combinations gave riſe to, were moſt beautifully diverſified by the mutual encroachments of woods and lawns, which coaſted each other, and traverſed the iſland in large tracts. The woods conſiſted of tall and well-ſpread trees, the greater part of them, celebrated either for their

their aſpect, or their fruit: while the lawns were uſually of a conſiderable breadth, their turf quite clean and uniform, it being compoſed of a very fine trefoil, which was intermixed with a variety of flowers. The woods too were in many places open, and free from all buſhes and underwood, ſo that they terminated on the lawns with a well-defined outline, where neither ſhrubs nor weeds were to be ſeen; but the neatneſs of the adjacent turf was frequently extended to a conſiderable diſtance, under the hollow ſhade formed by the trees. Hence aroſe a great number of the moſt elegant and entertaining proſpects, according to the different blendings of theſe woods and lawns, and their various interſections with each other, as they ſpread themſelves differently through the vallies, and over the ſlopes and declivities in which the place abounded.

" Nor were the allurements of TINIAN confined to the excellency of its landſcapes only; ſince the fortunate animals which, during the greateſt part of the year (except, indeed, when the Spaniards come and diſturb their ſolitude for the purpoſe of ſupplying GUAHAN with proviſions) are the ſole lords of this happy ſoil, partake, in ſome meaſure, of the romantic caſt of the iſland, and are no ſmall addition to its wonderful ſcenery: for the cattle, of which it is not uncommon to ſee herds of ſome thouſands feeding together in a large meadow, are certainly the moſt remarkable in the world; as they are all of them milk-white, except their ears, which are generally brown or black. And though there are no inhabitants here, yet the clamour and frequent parading of domeſtic poultry, which range the woods in great numbers, perpetually excite the idea of the neighbourhood of farms and villages, and greatly contribute to the cheerfulneſs and beauty of the place."

" The cattle on TINIAN," continues WALTER, " we computed were at

leaſt ten thouſand *; we had no difficulty in getting near them, for they were not at all ſhy of us. Our firſt method of killing them was ſhooting them; but, at laſt, when, by accidents to be hereafter recited, we were obliged to huſband our ammunition, our men ran them down with eaſe. Their fleſh was extremely well-taſted, and was believed by us to be much more eaſily digeſted than any we had ever met with. The fowls too were exceedingly good, and were likewiſe run down with little trouble; for they could ſcarce fly farther than a hundred yards at a flight, and even that fatigued them to ſuch a degree, that they could not readily riſe again; ſo that, aided by the openneſs of the woods, we could at all times furniſh ourſelves with whatever number we wanted.

"Beſides the cattle and the poultry, we found here abundance of wild hogs: theſe were moſt excellent food; but as they were a very fierce animal, we were obliged either to ſhoot them, or to hunt them with large dogs, which we found upon the place at our landing, and which belonged to the detachment that was then upon the iſland amaſſing proviſions for the garriſon of Guahan. As theſe dogs had been purpoſely trained to the killing of the wild hogs, they followed us very readily, and hunted for us; but though they were a large, bold breed, the hogs fought with ſo much fury, that they fre-

* This number is very conſiderable for an iſland which, according to the account, is not more than four leagues in length by two leagues in breadth; for, ſuppoſing, which is not the caſe, that it had the figure of a parallelogram (and this is that of the greateſt ſurface), its ſuperficies would yet be only eight leagues ſquare; but its figure is that of a very elongated ellipſis, which is reduced almoſt to nothing at the two extremities of its great axis: and if we deduct from its ſurface, that of the two great pieces of water which occupy the middle of the iſland, and the moſt elevated parts of the woody hills, on which it is not probable that the herds ſhould graze, we may reduce the ſurface of the ground, on which the cattle found their food, to four ſquare leagues at moſt: *each league* would then have fed *two thouſand five hundred oxen!* ought not alſo ſome reduction to be made in the *thirty thouſand inhabitants* that the Spaniards ſuppoſed this iſland to contain before its depopulation?

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quently deſtroyed them; whence we by degrees loſt the greateſt part of them.

" This place was not only extremely grateful to us from the plenty and excellence of its freſh proviſions, but was as much, perhaps, to be admired on account of its fruits and vegetable productions, which were moſt fortunately adapted to the cure of the ſea-ſcurvy, the diſeaſe which had ſo terribly reduced us. For in the woods there were inconceivable quantities of cocoa-nuts, with the cabbages growing on the ſame tree: there were, beſides, guavoes, limes, ſweet and ſour oranges, and a kind of fruit peculiar to theſe iſlands, called by the Indians *Rhymay*, but by us the *bread-fruit*, for it was conſtantly eaten by us during our ſtay upon the iſland inſtead of bread, and ſo univerſally preferred to it, that no ſhip's bread was expended during that whole interval *. Beſides the fruits already enumerated, there were many other vegetables extremely conducive to the cure of the malady we had long laboured under, ſuch as water-melons, dandelion, creeping purſlain, mint, ſcurvy-graſs, and ſorrel; all which, together with the freſh meats of the place, we devoured with great eagerneſs, prompted thereto by the ſtrong inclination which, in ſcorbutic diſorders, Nature never fails of exciting for thoſe powerful ſpecifics.

" It will eaſily be conceived from what hath been already ſaid, that our cheer upon this iſland was in ſome degree luxurious; but I have not yet recited all the varieties of proviſion which we here indulged in. Indeed, we thought

* At the time when *Walter* wrote, the bread-fruit tree and its fruit were little known; but the voyagers of theſe latter times have deſcribed it ſo well, that I diſpenſe with tranſcribing the deſcription given of it by *Anſon's* hiſtorian. However, it might ſo happen, that in reading this deſcription, a naturaliſt might perceive ſome difference between the bread-fruit tree of *Tinian*, and that which is a production common to all the iſlands of the *Great Ocean* ſituated between the tropics.

it prudent totally to abſtain from fiſh, the few we caught at our firſt arrival having ſurfeited thoſe who eat of them; but conſidering how much we had been inured to that ſpecies of food, we did not regard this circumſtance as a diſadvantage, eſpecially as the defect was ſo amply ſupplied by the beef, pork, and fowls already mentioned, and by great plenty of wild fowl; for it is to be remembered, that, near the centre of the iſland there were two conſiderable pieces of freſh water, which abounded with duck, teal, and curlew: not to mention the whiſtling-plover, which we found there in prodigious plenty.

" Having briefly recounted the conveniences of this place, the excellence and quantity of its fruits and proviſions, the neatneſs of its lawns, the ſtatelineſs, freſhneſs, and fragrance of its woods, the happy inequality of its ſurface, and the variety and elegance of the views it afforded, I muſt now obſerve that all theſe advantages were greatly enhanced by the healthineſs of the climate, by the almoſt conſtant breezes which prevail there, and by the frequent ſhowers which fell; for theſe, inſtead of the heavy, continued rains which, in ſome countries, render great part of the year ſo unpleaſing, were uſually of very ſhort and almoſt momentary duration. Hence they were extremely grateful and refreſhing; and were, perhaps, one cauſe of the ſalubrity of the air, and of the extraordinary influence it was obſerved to have upon us, increaſing and invigorating our appetites and digeſtion.

" After giving theſe large encomiums to this iſland, in which, however, I conceive, I have not done it juſtice; it is neceſſary I ſhould ſpeak of thoſe circumſtances in which it is defective, whether in point of beauty or utility. And firſt, with reſpect to its water, I muſt own, that, before I had ſeen this ſpot, I did not conceive that the abſence of running water, of which it is entirely deſtitute, could have been ſo well replaced by any other means, as it is in this iſland; ſince, though there are no ſtreams, yet the water of the wells

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and ſprings, which are to be met with every where near the ſurface, is extremely good; and in the midſt of the iſland there are two or three conſiderable pieces of excellent water, the turf of whoſe banks was as clean, as even, and as regularly diſpoſed, as if they had been baſons purpoſely made for the decoration of the place. It muſt, however, be confeſſed, that with regard to the beauty of the proſpects, the want of rills and ſtreams is a very great defect, not to be compenſated either by large pieces of ſtanding water, or by the neighbourhood of the ſea, though that, from the ſmallneſs of the iſland, generally makes a part of every extenſive landſcape.

" As to the reſidence upon the iſland, the principal inconvenience attending it is the vaſt numbers of muſkitoes, and various other ſpecies of flies, together with an inſect called a tick; this, though principally attached to the cattle, would yet frequently faſten upon our limbs and bodies, and, if not perceived and removed in time, would bury its head under the ſkin, and raiſe a painful inflammation. We found here too centipedes and ſcorpions, which we ſuppoſed were venomous, though none of us ever received any injury from them.

" But the moſt important and formidable exception to this place remains ſtill to be told. This is the inconvenience of the road, and the little ſecurity there is, in ſome ſeaſons, for a ſhip at anchor. The only proper anchoring-place for ſhips of burden is at the ſouth-weſt end of the iſland; the peak of SAYPAN, ſeen over the northern part of SAYPAN, and bearing north-north-eaſt half eaſt, is a direction for readily finding it; the anchoring-place is then eight miles diſtant. Here the CENTURION anchored in twenty-two fathoms water, about a mile and a half from the ſhore, oppoſite to a ſandy bay. The bottom of this road is full of ſharp-pointed coral rocks, which, during four months of the year, that is, from the middle of *June* to the middle of *October*, render it a very unſafe anchorage. This is the

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ſeaſon of the weſtern monſoons, when, near the full and change of the moon, but more particularly at the change, the wind is uſually variable all round the compaſs, and ſeldom fails to blow with ſuch fury, that the ſtouteſt cables are not to be confided in. What adds to the danger at theſe times, is the exceſſive rapidity of the tide of flood which ſets to the ſouth-eaſt, between this iſland and that of Aguigan, a ſmall iſlot near the ſouthern extremity of Tinian, which, in the galleon's chart, is repreſented only by a dot. This tide runs at firſt with a vaſt head and overfall of water, occaſioning ſuch a hollow and overgrown ſea, as is ſcarcely to be conceived; ſo that we were under the dreadful apprehenſion of being pooped by it, though we were in a ſixty gun ſhip. In the remaining eight months of the year, that is, from the middle of *October* to the middle of *June*, there is a conſtant ſeaſon of ſettled weather; when, if the cables are but well armed, there is ſcarcely any danger of their being even rubbed; ſo that during all that interval, it is as ſecure a road as could be wiſhed for. I ſhall only add, that the anchoring bank is very ſhelving, and ſtretches along the ſouth-weſt end of the iſland, and is entirely free from ſhoals, except a reef of rocks which is viſible, and lies about half a mile from the ſhore, affording a narrow paſſage into a ſmall ſandy bay, which is the only place where boats can poſſibly land*."

Such was the Iſland of Tinian, when Commodore Anson quitted it towards the end of the month of October 1742. The only fault that could then be found with it, was, that it afforded no harbours, no roadſtead where ſhips could anchor in ſafety; and it ſeems that Nature, who had beſtowed every thing on the land of this favoured iſland, was determined to refuſe every thing to the ſea that waſhes its coaſt: for it has been ſeen that the fiſh there is not good, and the anchorage is no better. Twice had the Centurion her cables cut by the ſharp coral rocks, with which the bot-

* *Anſon's Voyage*, Book III. Chap. II.

tom

tom is ſtrewn; twice was ſhe driven out to ſea; and it was not without much difficulty that ſhe could regain her anchorage, to the very great ſatisfaction of that part of her officers and crew, which had been left on ſhore by ſo precipitate and neceſſary a departure.

I have not ſtopped to deſcribe thoſe ancient monuments which were found in the iſland, thoſe double ſymmetrical rows of ſquare pyramidal pillars, meaſuring about five feet at the baſe and thirteen feet in height, each ſurmounted by a ſemi-globe, with the flat ſurface upwards, and which, at a diſtance, preſents the appearance of a large bowl. Of theſe, a deſcription may be read, and a drawing ſeen, in RICHARD WALTER's narrative*. According to the account of the Spaniſh priſoners, theſe pillars muſt have belonged to ſome Indian monaſteries, and this particularity would alone be ſufficient to atteſt the ancient population of the iſland: in all the countries of ASIA, the monks eſtabliſh themſelves wherever numbers of inhabitants can feed their idleneſs; and they muſt needs have been very numerous on TINIAN, for there is no part of the iſland on which ANSON did not meet with ſome of theſe decorations of pyramidal pillars. And how ſhould men, addicted to contemplation, not have abounded in a country where Nature, rich and beautiful, affords eternal verdure, ſites pictureſque and diverſified, trees loaded with bloſſoms and fruits, meadows enamelled with odoriferous flowers, woods whoſe ſacred ſhade invites to meditation and ſeems to command ſilence; a country, in ſhort, where the beauty of the climate, and the ſalubrity of the air, remove diſeaſes, and retard the fatal period in which every thing is confounded?

* The pillars and the ſemi-globes by which they were ſurmounted, were ſolid, and formed of a compoſition of ſtone and ſand, covered with plaſter; but as the voyagers who viſited *Tinian* 22 years after the voyage of *Anſon*, make no mention of them, we muſt ſuppoſe that, in this interval, time reduced them to duſt. However, when in 1765, *Byron* cauſed the Iſland of *Saypan* to be viſited, the *Tamar's* people there found pillars ſimilar to thoſe of *Tinian*, and which were ſtill ſtanding.

It

It is with regret that we are going to quit ANSON's TINIAN, in order to fix our eyes on the TINIAN of which the navigators of theſe latter times have drawn us the picture. Both, no doubt, have painted what they ſaw; and of this fact we muſt be certain, to believe that, within the lapſe of barely four luſtres, the face of every thing has been changed.

Commodore BYRON put into TINIAN on the 31ſt of July 1765, and anchored in the ſame road, ſituated near the ſouth-weſt point, which Commodore ANSON had occupied twenty-one years and a half before. Impatient to contemplate thoſe raviſhing ſcenes, thoſe vaſt meadows enamelled with flowers where herds of cattle of a dazzling whiteneſs feed at liberty; impatient to breathe, with a pure air, that delicious perfume exhaled by the odoriferous productions of the earth, " as ſoon as the ſhip was ſecured," ſays the Commodore; " I went on ſhore to fix upon a place where tents might be erected for the ſick. We found ſeveral huts which had been left by the Spaniards the year before; for this year none of them had as yet been at the place, nor was it probable that they would come for ſome months, the ſun being almoſt vertical, and the rainy ſeaſon ſet in. After I had fixed upon a ſpot for the tents," continues the Commodore, " ſix or ſeven of us endeavoured to puſh through the woods, that we might come at the beautiful lawns and meadows of which there is ſo luxuriant a deſcription in the account of Lord ANSON's Voyage, and, if poſſible, kill ſome cattle. The trees ſtood ſo thick, and the place was ſo overgrown with underwood, that we could not ſee three yards before us; we therefore were obliged to keep continually hallooing to each other, to prevent our being ſeparately loſt in this trackleſs wilderneſs. As the weather was intolerably hot, we had nothing on beſides our ſhoes, except our ſhirts and trowſers, and theſe were, in a very ſhort time, torn all to rags by the buſhes and brambles: at laſt, however, with incredible difficulty and labour we got through;

but,

but, to our great ſurpriſe and diſappointment, we found the country very different from the account we had read of it: the lawns were entirely overgrown with a ſtubborn kind of reed or bruſh, in many places higher than our heads, and no where lower than our middles, which continually entangled our legs, and cut us like whipcord. During this march we were alſo covered with flies from head to foot; and, whenever we offered to ſpeak, we were ſure of having a mouthful, many of which never failed to get down our throats. After we had walked about three or four miles, we got ſight of a bull, which we killed, and, a little before night, we got back to the beach, as wet as if we had been dipt in water, and ſo fatigued that we were ſcarcely able to ſtand. We immediately ſent out a party to fetch the bull, and found that, during our excurſion, ſome tents had been got up, and the ſick brought on ſhore.

"The next day our people were employed in ſetting up more tents, getting the water-caſks on ſhore, and clearing the well at which they were to be filled. This well I imagined to be the ſame that the CENTURION watered at; but it was the worſt that we had met with during the voyage, for the water was not only brackiſh, but full of worms. The road alſo where the ſhips lay was a dangerous ſituation at this ſeaſon; for the bottom is hard ſand and large coral rocks, and the anchor having no hold in the ſand, is in perpetual danger of being cut to pieces by the coral; to prevent which as much as poſſible, I rounded the cables, and buoyed them up with empty water-caſks. Another precaution alſo was taught me by experience; for at firſt I moored, but finding the cables much damaged I reſolved to lie ſingle for the future, that by veering away or heaving in, as we ſhould have more or leſs wind, we might always keep them from being ſlack, and conſequently from rubbing; and this expedient ſucceeded to my wiſh. At the full and change of the moon, a prodigious ſwell tum-

bles in, ſo that I never ſaw ſhips at anchor roll ſo much as ours did while we lay here; and it once drove in from the weſtward with ſuch violence, and broke ſo high upon the reef that I was obliged to put to ſea for a week; for, if our cable had parted in the night, and the wind had been upon the ſhore, which ſometimes happens for two or three days together, the ſhip muſt inevitably have been loſt upon the rocks.

" I ſoon found that the iſland produced limes, ſour oranges, cocoa-nuts, bread-fruit, guavas, and paupaws* in great abundance; but we found no water-melons, ſcurvy-graſs, or ſorrel.

" Notwithſtanding the fatigue and diſtreſs that we had endured, and the various climates we had paſſed through, neither of the ſhips (the DOLPHIN and the TAMAR), had yet loſt a ſingle man ſince their ſailing from ENGLAND; but, while we lay here, two died of fevers, a diſeaſe with which many were ſeized, though we all recovered very faſt from the ſcurvy. I am, indeed, of opinion that this is one of the moſt unhealthy ſpots in the world, at leaſt during the ſeaſon in which we were here. The rains were violent, and almoſt inceſſant, and the heat was ſo great as to threaten us with ſuffocation.

" Beſides the inconvenience which we ſuffered from the weather, we were inceſſantly tormented by the flies in the day, and by the muſkitoes in the night. The iſland alſo ſwarms with centipedes and ſcorpions, and a large black ant, ſcarcely inferior to either in the malignity of its bite. Beſides theſe, there were venomous inſects without number, altogether un-

* It appears that the ſweet orange was no longer to be found in the iſland, in *Byron's* time, for he does not ſpeak of it; but he found there the papaw, of which no mention is made in *Anſon's* narrative: have the Spaniards conveyed thither the papaw-tree?

known to us, by which many of us ſuffered ſo ſeverely that we were afraid to lie down in our beds; nor were thoſe on board in a much better ſituation than thoſe on ſhore, for great numbers of theſe creatures being carried into the ſhip with the wood, they took poſſeſſion of every birth, and left the poor ſeamen no place of reſt either below or upon the deck.

" As ſoon as we were ſettled in our new habitations, I ſent out parties to diſcover the haunts of the cattle, ſome of which were found, but at a great diſtance from the tents, and the beaſts were ſo ſhy that it was very difficult to get a ſhot at them. Some of the parties which, when their haunts had been diſcovered, were ſent out to kill them, were abſent three days and nights before they could ſucceed; and when a bullock had been dragged ſeven or eight miles, through ſuch woods and lawns as have juſt been deſcribed, to the tents, it was generally full of fly-blows, and ſtunk ſo as to be unfit for uſe: nor was this the worſt, for the fatigue of the men in bringing down the carcaſs, and the intolerable heat they ſuffered from the climate and the labour, frequently brought on fevers which laid them up. Poultry, however, we procured on eaſier terms: there was great plenty of birds, and they were eaſily killed; but the fleſh of the beſt of them was very ill-taſted; and ſuch was the heat of the climate that, within an hour after they were killed, it was as green as graſs, and ſwarmed with maggots. Our principal reſort for freſh meat, was the wild hog, with which the iſland abounds. Theſe creatures are very fierce, and ſome of them ſo large that a carcaſs frequently weighed two hundred pounds. We killed them without much difficulty, but a black belonging to the TAMAR contrived a method to ſnare them, ſo that we took great numbers of them alive, which was an unſpeakable advantage; for it not only inſured our eating the fleſh while it was ſweet, but enabled us to ſend a good number of them on board as ſea-ſtores.

"In the mean time," adds the Commodore, "we were very desirous of procuring some beef in an eatable state, with less risk and labour; and Mr. GORE, one of our mates, at last discovered a pleasant spot upon the north-west part of the island, where cattle were in great plenty, and whence they might be brought to the tents by sea. To this place therefore I dispatched a party, with a tent for their accommodation, and sent the boats every day to fetch what they should kill; sometimes, however, there broke such a sea upon the rocks that it was impossible to approach them, and the TAMAR's boat unhappily lost three of her best men in attempting it. We were now, upon the whole, pretty well supplied with provisions, especially as we baked fresh bread every day for the sick; and the fatigue of our people being less, there were fewer ill with the fever: but several of them were so much disordered by eating of a very fine looking fish which we caught here, that their recovery was for a long time doubtful. The author of the account of Lord ANSON's voyage says that the people on board the CENTURION thought it prudent to abstain from fish, as the few which they caught on their first arrival surfeited those who eat of them. But not attending sufficiently to this caution, and too hastily taking the word *surfeit* in its literal and common acceptation, we imagined that those who tasted the fish when Lord ANSON first came hither, were made sick by merely eating too much; whereas, if that had been the case, there would have been no reason for totally abstaining afterwards, but only eating temperately. We, however, bought our knowledge by experience, which we might have had cheaper; for, though all our people who tasted this fish, eat sparingly, they were all soon afterwards dangerously ill.

"Besides the fruit that has been mentioned already, this island produces cotton and indigo in abundance, and would certainly be of great value if it was situated in the WEST INDIES *."

* See *Hawkesworth's Compilation.* Vol. I. p. 116 and following.

Such

Such was the ſtate in which the Iſland of TINIAN preſented itſelf to Commodore BYRON, during the ſtay that he made there in 1765, from the 31ſt of July to the 1ſt of October.

Captain WALLIS, who viſited it in the month of September 1767, draws of it a picture neither more flattering, nor better calculated for retracing to us the charms of the TINIAN deſcribed by Commodore ANSON. He ſays, however, that "the hunters, whom he had ſent out on the day of his arrival, brought in a fine young bull of near four hundred weight: and that in this place he got beef, pork, poultry, papaw-apples, bread-fruit, limes, oranges, and every refreſhment that is mentioned in the account of Lord ANSON's voyage; but that fleſh meat could be ſcarcely kept ſweet one day. There had been many cocoa-nut trees near the landing-place," continues he; "but they had been all waſtefully cut down for the fruit, and none being grown up in their ſtead, we were forced to go three miles into the country before a ſingle nut could be procured. The hunters alſo ſuffered conſiderable fatigue; for they were frequently obliged to go ten or twelve miles through one continued thicket, and the cattle were ſo wild that it was very difficult to come near them; ſo that I was obliged to relieve one party by another; and it being reported that cattle were more plenty at the North end of the iſland, but that the hunters being quite exhauſted with fatigue, when they got thither, were not able to kill them, much leſs to bring them down, I ſent Mr. GORE, with fourteen men, to eſtabliſh themſelves in that part of the iſland, and ordered that a boat ſhould go every morning, at day-break, for what they ſhould kill*."

In addition to the refreſhments before-mentioned, Captain WALLIS obtained an ample ſtock of limes, which he appropriated to the wants of his people.

* *Hawkeſworth's Compilation.* Vol. I. *Wallis's Voyage,* Chapter XI. page 279.

Captain

Captain PORTLOCK, who, on the 4th of October, 1787, croſſed the Archipelago of the MARY-ANNE Iſlands between TINIAN and SAYPAN, ſays that, in the plains of the former, he obſerved a number of white animals grazing, which he ſuppoſed to be the white cattle that, in Lord ANSON's Voyage, are ſaid to be ſo common there; but he reconnoitred the iſland only at a diſtance, and could not judge of its preſent state*.

Captain GILBERT, commanding the ſhip CHARLOTTE, paſſed the beginning of the month of Auguſt 1788, at the anchorage of TINIAN; he would have been well pleaſed to find there the terreſtrial paradiſe repreſented in ANSON's voyage; but he found only the wild country of which BYRON has drawn us ſo hideous a picture: his account is as as follows: "From the obſervations I was able to make, during my ſhort ſtay at this iſland, the deſcription given by Captain WALLIS ſeems to correſpond the neareſt with the preſent ſtate of it. The ground was overgrown with underwood, and the cattle did not appear to be by far ſo plenty as deſcribed in ANSON's voyage. The well, at which Lord ANSON watered, was dry; and as for the numerous ſprings there ſpoken of, few of them fell in my way. The neareſt water to the landing place lay too far off for me to receive any benefit from it, in the preſent debilitated ſtate of the ſhip's company. Among the trees I obſerved great numbers of the cotton-tree, in full bloom; and fell in with a village, the huts of which appeared to have been for ſome time deſerted. However, the little time I was there, I got great abundance of cocoa-nuts, cabbages, bread-fruit, wild hogs, fowls, &c. &c. I ſaw large herds of white cattle, but was not able to manage any of them, except a few of their calves†."

* *Portlock's Voyage*, p. 317.

† *Voyage from New South Wales to Canton, in the year* 1788. *By* Thomas Gilbert. *London*, 1789. pages 66 and 67.

Like

Like Commodore ANSON, Captain GILBERT experienced the danger of the roadſtead: the CHARLOTTE, and the SCARBOROUGH which anchored there near her, were forced, in a gale of wind, to cut their cables, and put to ſea*.

I obſerve that, among the large trees which GILBERT saw at TINIAN, he diſtinguiſhed a great number of cotton-trees, and that they were in full bloſſom: we have ſeen that in 1765, BYRON had already found there the cotton-tree, together with the indigo-tree. It cannot be doubted that this iſland would have been very fertile, and that it would have been very eaſy to naturalize there the uſeful productions of both INDIES, if the right of conqueſt had ſubjected it to other maſters than the Spaniards: but the latter, incapable of cultivating, with their own hands, every part of the earth of which they have declared themſelves the proprietors, have too frequently, by a policy no leſs inhuman than contrary to their true intereſts, deſtroyed or diſperſed, the real proprietors, the original

* In recapitulating what is reported of the road and anchorage in the different journals, to which we refer the reader for farther particulars, it appears:

That, on the 22d of September, 1742, the *Centurion* parted two cables and was driven to ſea, dragging with her a third anchor, which ſhe had let go on the edge of the bank; and that ſhe could not regain the road till the 11th of October.

That, on the 14th of October, being but the third day after her arrival, a ſudden gale of wind, brought home her anchor, forced her off the bank, and drove her to ſea a ſecond time; and ſhe was five days before ſhe could return to her anchorage.

That, in the beginning of Auguſt, 1768, the weſterly ſwell forced *Byron* to get under way; and that he could not take up the anchorage again for a week.

That, on the 8th of Auguſt, 1788, the *Charlotte* and the *Scarborough* were forced to cut their cables, and put to ſea.

But *Anſon* affirms that, during eight months of the year, that is, from the middle of October to the middle of June, there is a conſtant ſeaſon of ſettled weather, and that, provided the cables be but well armed, or buoyed up, there is little danger of their being rubbed; in ſhort, during theſe eight months, the road on the ſouth-weſt end of the iſland of *Tinian* is, he adds, as ſecure a road as could be wiſhed for.

cultivators,

cultivators, who alone can compenſate for the inſufficiency of the conquerors.

Captain SEVER, commanding the Ship LADY PENRHYN, touched at TINIAN, in the month of September 1788. He confirms all that Commodore BYRON and Captain WALLIS have reported of the preſent ſituation of this iſland; but although he landed there at the ſame time of the year as the latter, he found the ſeaſon very backward; moſt of the fruits were not arrived at their point of maturity: however, he procured two oxen, a wild hog, and a dozen of fowls*.

When we have read the two deſcriptions of TINIAN, which both, no doubt, equally merit our confidence, from the well-founded opinion of the veracity of the voyagers by whom they were written, we cannot avoid being ſtruck with aſtoniſhment, on examining the ravages which time, whoſe hand is not always ſlow, has been able to commit in an interval that does not amount to the fourth of a century. Behold TINIAN in 1742, divided between ſmiling plains and ſloping hills, crowned with woods whoſe tall trees growing in rows, at regular diſtances, and cleared of barren and obſtructing ſhrubs, leave to the air a free circulation, which permits it to purify itſelf in its courſe; behold it decked out with all the gifts of the creation, which the colouring of the painter has, if you pleaſe, embelliſhed, but the features of which he has given; and return to TINIAN in 1765: you will ſee withered ruſhes, melancholy heaths, and prickly brambles, occupy in its plains, now become waſtes, the places which were covered by verdant trefoil, ſalutary herbs, uſeful plants, and odoriferous flowers: ſeek on thoſe lawns the numerous herds which conſtituted their ornament and richneſs, and on which a fecundified land laviſhed food ever-reviving: at this day, a hideous, briſtling,

* See *The Voyage of Governor Philip to Botany Bay*, &c. *London*, 1789. 4to. page 245.

impaſſable

impaſſable bur repels them, and denies them ſubſiſtence: attempt to penetrate into theſe woods; thick briars, ſtubborn and ſtrong graſs prohibit you from entering them; paraſitical *lianes* *, intertwined and intermingled, ſtretch their tendrils from one tree to another, and intercept all communication; a ſoil, on which the down of the enamelled moſs extended into the very heart of the clumps, is now only the impure aſylum of centipedes, ſcorpions, and all the venomous inſects which live and generate their poiſon in the rubbiſh of vegetation: there no longer remains of the former TINIAN any of the charms which occaſioned to be overlooked the importunity of its gnats, the noxious quality of its fiſhes, and the dangers of its roadſtead: the fourth of a century has been ſufficient for effecting all theſe changes!

This contraſt of two pictures ſo different from each other, that, in comparing them, we have ſome difficulty in perſuading ourſelves that the voyagers meant to delineate the ſame iſland; this contraſt, I ſay, leads us back to the obſervation, depoſited in his immortal work by the ſublime philoſopher, whoſe bold genius, traverſing the obſcurity of time, and hovering over ſpace in order to aid creation, would have divined Nature, had Nature choſen to be divined, and who has at leaſt marked out to us the track, which ſhe might have followed, if it be not, in fact, the track which ſhe has followed.

* *Lianes*, winding like ivy, run up the large trees which they meet with; and, there are ſome which, after having reached the talleſt branches, throw out tendrils which fall again perpendicularly, bury themſelves in the ground, there take freſh root, and riſe again, aſcending and deſcending alternately. Other filaments borne obliquely by the wind, or by ſome accident, frequently faſten on the neighbouring trees, and form either an impenetrable foreſt, or a confuſion of cords hanging in every direction, which preſent to the eye the ſame aſpect as the running rigging of a ſhip. There are *lianes* as thick as the arm; ſome, by dint of claſping the tree which they embrace, finiſh by choking it. Sometimes it happens that the tree dries while ſtanding, rots, and entirely decays, and that there remain only the ſpirals of the *liane*, which form a ſort of twiſted column, inſulated and perforated, which art would find much difficulty in imitating." (See *Bomare's Dict. de Hiſt. Nat.* at the word *Liane.*)

"Man," ſays BUFFON, "maſter of the domain of the earth, has changed "and renewed its whole ſurface, and at all times has ſhared the empire "with Nature. However, he reigns only by right of conqueſt; he enjoys "rather than poſſeſſes; he preſerves only by unremitting care: if that ceaſe, "every thing languiſhes, every thing changes, every thing returns under the "hand of Nature; ſhe reſumes her rights, effaces the works of Man, and "leaves him nothing but the regret of having loſt, through his own negli-"gence, what his anceſtors had conquered by their labours*."

This digreſſion has made us loſe ſight of the SOLIDE; it is time to rejoin her, that we may follow her in her route to MACAO.

After having croſſed the archipelago of the MARY-ANNE Iſlands, Captain MARCHAND ſteered between weſt-north-weſt and weſt by north, in order to make the ſouth point of the Iſland of FORMOSA.

The obſervations for the longitude made on the 16th of November in the morning, placed the ſhip, at noon on that day, in 122° 6′ eaſt from PARIS; and her obſerved latitude was 21° 34′ north. This poſition afforded Captain MARCHAND the hope that, on the following day, he would get ſight of the land. It appeared, in fact, the next morning at half paſt ſeven o'clock, and he diſtinguiſhed the Iſlands of BOTEL TABAGO XIMA†, ſituated at the diſtance of about five leagues from the ſouth point of FORMOSA, and on the ſame parallel: the large iſland is a high land which may be perceived, in clear weather, eighteen or twenty leagues. At half paſt nine o'clock, the

* *Hiſt. Nat.* 1re *Vue de la Nature.*

† According to *Alexander Dalrymple;* and according to others, *Botel* or *Bottel*, *Tabaco Xima*, or *Tabago Xima;* and *Tabaco-ſima*, according to *D'Anville.*

largeſt

largeſt of theſe iſlands bore from weſt half north to weſt by north, and the ſmall iſland, weſt half ſouth, diſtant about twelve leagues.

At half paſt five o'clock in the afternoon, at the moment when the eaſtern extremes of both the BOTEL Iſlands bore, in one with each other, north by weſt, was perceived to the weſt by north the ſouth point of the Iſland of FORMOSA. This part of the iſland preſents a land of a remarkable height, which is to be perceived at the diſtance of twenty or even twenty-two leagues.

On the 18th, at noon, the SOLIDE had left this point to the eaſt-north-eaſt half north, at the diſtance of about four leagues and a half, and was ſtanding on for MACAO.

Captain CHANAL, according to the obſervations of Captain MARCHAND, and his own, combined with various bearings taken of the land, has endeavoured to fix the geographical poſitions, both abſolute and relative, of the BOTEL Iſlands, of the ſouth point of FORMOSA, and of VELE-RETE, a very dangerous ſhoal, lying in the track of ſhips coming from the GREAT OCEAN to the northward of the BASHEE Iſlands. As the poſitions given by Captain CHANAL do not all agree with thoſe which have been employed by ALEXANDER DALRYMPLE, in his *Chart of the China Sea*, publiſhed in 1771; by LA PE'ROUSE, in the journal of his voyage and in his chart; by GEORGE ROBERTSON, in his large *Chart of the China Sea*, which appeared in 1791, and in his *Table of Poſitions*, which makes part of the Memoir that accompanies the chart and ſerves as a foundation for it; I have thought it incumbent on me to report them as given by each, to the end that navigators who may have an opportunity of making obſervations in ſight of the ſame

points, may the more easily verify the different positions, and decide which merit the preference.

According to the observations and the bearings taken on board of the SOLIDE in sight of the land:

The great Island of BOTEL TABAGO-XIMA, at its south-east point, is situated in 22° 3′ north latitude, and 119° 34′ east longitude *. This island is sufficiently elevated to be perceived, in clear weather, at the distance of fifteen leagues: it may be four or five leagues in circumference. The fires which were seen blazing during the night left no doubt of its being inhabited, at least in a temporary manner, by fishermen, if, however, it have not inhabitants who make it their constant residence.

But, in order not to suffer the opinion of seamen to waver, I think I may venture to take the liberty of here anticipating on the publication of LA PE'ROUSE's voyage, for the purpose of adding that the island is inhabited, that it even appears well peopled, since LA PE'ROUSE, on approaching very near to it, distinguished three villages within the space of a league.

	Lat.	Long.
	° ′ ″	° ′ ″
* According to *Dalrymple's* Chart 8° 15′ from *Macao* which is situated (Note LX) in 111° 15′	22 6 30	119 30 00
According to the observations of *La Pérouse*	21 57 00	119 32 00
According to *Chanal*, the middle of the island, 22° 4′ and 119° 33′; and in taking away 1 minute from the latitude, and adding 1 min. to the longitude, in order to reduce them to the south-east point of the island	22 3 00	119 34 00
According to *G. Robertson*, in his Table of Positions	22 6 00	119 21 45

The ſmall iſland of the ſame name lies to the ſouth by eaſt of the great one*; its latitude is 21° 57′, and its longitude 119° 36′ †. It is ſomewhat leſs elevated than the great iſland, but however ſufficiently ſo to be ſeen ten or twelve leagues.

The paſſage between theſe two iſlands may be four or five miles in width: the channel and both ſhores appeared equally free from rocks or ſhoals.

The ſouth-weſt point of the Iſland of FORMOSA may be placed in latitude 21° 54′, according to that of the ſhip obſerved on the 18th at noon, in 21° 48′, and according to the bearing, which placed this point 6 minutes more to the northward than the ſhip: its longitude is about 118° 40′ ‡.

The VELE-RETE ſhoal lies to the ſouth 4 or 5° weſt of the ſouth point of FORMOSA, towards the latitude of 21° 45′, and longitude of 118° 39′ §. Theſe

* On the parallel of the middle of the great iſland, according to *Dalrymple's* chart, and on the parallel of its ſouth-eaſt point, according to that of *La Pérouſe*.

	Lat. ° ′ ″		Long. ° ′ ″
† According to *Dalrymple's* Chart, in 8° 22′ eaſt from *Macao*	22 7 00	.....	119 27 00
According to *La Pérouſe*, from his difference of meridian in regard to the great iſland, taken on his chart, 5 min. more to the eaſtward	21 57 00	.....	119 37 00
According to *Chanal* (as above)	21 57 00	.....	119 36 00
‡ According to *Dalrymple's* chart 7° 19′ to the eaſtward of *Macao*	22 2 30	.....	118 34 00
According to that of *La Pérouſe*, 5 min. more to the northward, and 52 min. leſs to the eaſtward than the ſouth-eaſt point of the *Great Botel*	22 2 00	.....	118 40 00
According to *Chanal* (as above)	21 54 00	.....	118 40 00
Robertſon's Memoir (in his Table of Poſitions)	22 6 00	.....	118 49 45
§ According to *Dalrymple's* chart 7° 21′ 20″ to the eaſt of *Macao*	21 48 00	.....	118 36 30

According

Theſe rocks are even with the water's edge, and cannot be perceived at more than two leagues' diſtance. A ſhip muſt borrow on the point of the Iſland of FORMOSA, which is ſafe, cloſer than on the ſhoal, to which it is prudent to give a good birth *.

On the 18th of November, in ſight of the ſouth-weſt point of the Iſland of FORMOSA, I ſtop the calculation of the SOLIDE's run from the SANDWICH Iſlands to MACAO.

In deducing the longitude of this point from that of the ſouth-eaſt point of the Great BOTEL TABAGO-XIMA, which is determined by the obſervations of LA PE'ROUSE, we find that the former muſt be 118° 40′; and according to the bearing taken at noon of the 18th, the ſhip was, with reſpect to the

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	Lat.		Long.
	° ′ ″		° ′ ″
According to that of *La Pérouſe*, 3 min. leſs to the northward, and 40 min. leſs to the eaſtward than the ſouth-eaſt point of the *Great Botel*	21 49 00	.....	118 52 00
According to *Chanal* (as above)	21 45 00	.....	118 39 00
According to *Robertſon*	21 45 00	.....	118 47 45

* *G. Robertſon* in his *Memoir of a Chart of the China Sea*, page 33, gives an extract from the Journal of the *Royal Captain*, which preſents a few details reſpecting the *Vele-Rete* Shoal.

"On the 23d of October 1762, at 9 A. M. ſaw the Rock *Vele-Rete* bearing weſt by north; at "noon, it bore north 2½ leagues: it ſeems environed with rocks, extending a mile or two round "it, on which the ſea breaks very high: I judge its diſtance from the ſouth part of *Formoſa* to "be 5 or 6 leagues; and, appearing very ſmall, it is not to be ſeen above 3 or 4 leagues in clear "weather. When this rock bore north-weſt by north, we perceived the water diſcoloured; but "in half an hour it changed its hue to a ſea-colour.

"Latitude obſerved 21° 38′ north.
"Ditto of the rock 21° 45′ north."

Since *Vele-Rete* is in latitude 21° 45′, nearly ſouth of the ſouth point of *Formoſa*, and ſince this point lies in about 22°, the width of the paſſage between the iſland and the ſhoal muſt be 15 miles or 5 leagues.

ſouth-

ſouth-weſt point of FORMOSA, 12⅓ minutes leſs to the eaſtward than the point: her longitude muſt therefore have been 118° 27′ 40″.

But on the 16th at noon, the longitude of the SOLIDE deduced from the obſervations was 122° 6′; and, from the 16th to the 18th, the progreſs by account towards the weſt had been 3° 43′: thus her longitude on the 18th was 118° 32′. It is ſeen that it differs from the true only by 4 minutes, or about a league and a quarter*: and the difference might have been more conſiderable, without our navigators being juſtified in imputing it to the obſervations of the 16th, ſince they were obliged to employ the dead reckoning for the forty-eight hours elapſed between the 16th and the 18th.

If, at preſent, we wiſh to find the error of the reckoning on the whole of the run, we have only to compare the difference of longitude indicated by the dead reckoning between the point of departure on the 7th of October and the point arrived at on the 18th of November, with the true difference deduced from the obſervations which have fixed the poſition of theſe two extreme points.

The true difference of longitude is 83° 3′ †; the difference given by the dead reckoning is 76° 44′ ‡. The latter is therefore ſmaller than the former by 6° 19′, which, on the parallel of the point arrived at, anſwer to a little more than one hundred and ſeventeen leagues.

* *See* Note LVIII.

† Longitude of the point of departure in ſight of *O-Whyhee*, on the 7th of October, 158° 29′ *weſt*—Longitude of the point arrived at in ſight of the ſouth-weſt point of the Iſland of *Formoſa*, on the 18th of November (as above) 118° 28′ *eaſt*. Difference of longitude 83° 3′. (See the *Journal of the Route* at the 7th of October and at the 18th of November, and Note LVIII.)

‡ Longitude of the point of departure 158° 29′ *weſt*—Longitude of the point arrived at, by account, 124° 47′ *eaſt*. Difference of longitude, by account, 76° 44′. (See the *Journal of the Route*, and Note LVIII.)

If we divide this ſum of the partial errors of the reckoning, by the number of days of the run, that is to ſay, by $41\frac{3}{4}$, we ſhall have for the mean error in twenty-four hours, $8\frac{4}{10}$ miles: and the quantity of this error confirms a remark which we have reaſon to make in reading the journals of navigators; this is, that in croſſing the GREAT OCEAN between the tropics, the general current of the waters, from eaſt to weſt, carries ſhips to the weſtward by an imperceptible movement which may be eſtimated at eight or nine miles, or about three leagues a day. But this movement, which eſcapes the uncertain methods of the pilot, cannot eſcape the obſervations of the aſtronomer.

On loſing ſight of the Iſland of FORMOSA, the SOLIDE directed her courſe for MACAO.

On the 20th, land was diſcovered at half paſt ſix o'clock in the morning; it bore north-weſt; but the miſt did not yet allow of its being diſtinguiſhed: Captain MARCHAND ſtood on to approach it. The fog not having cleared up, he was compelled to paſs the night in making ſhort boards.

The next morning, at half paſt ſeven o'clock, he diſcerned PEDRA BRANCA (the White Rock) to the weſt by ſouth 3° ſouth: he ſteered ſo as to paſs to the ſouthward of it; and at half paſt nine, it bore directly north, diſtant two miles. PEDRA BRANCA is a ſmall white rock, high, and ſteep, ſituated eighteen leagues to the eaſt-north-eaſt of the GRAND LEMA, the moſt eaſtern and the moſt conſiderable of the group which bears that name *, and

* According to *G. Robertſon* (page 12 of his *Memoir of a Chart of the China Sea*) the latitude of *Pedra Branca*, from a good obſervation, is 22° 20′ 00″ north; and its longitude from *Greenwich* 115° 8′ deduced from *Macao*, or 115° 14′ 00″, if we place *Macao*, as I have done (Note LX) in 113°

and lies to the eaſtward of the numerous iſlands that form the roads of MACAO, and the mouth of the river of CANTON. PEDRA BRANCA may be perceived at four or five leagues' diſtance.

The ſea was covered with fiſhing-boats. Captain MARCHAND fired a gun as a ſignal for a pilot acquainted with the coaſt; and it was not long before an officious Chineſe, but we cannot ſay a diſintereſted one, made his appearance. The weather being rather bad; he was not afraid of rating his ſervices at too high a price: he demanded 70 dollars, and required that the ſum ſhould be paid him beforehand: as he neither underſtood French, Engliſh, nor Portugueſe, and as Captain MARCHAND neither had the means nor the time to diſpute about the ſum, he paid it, and put the SOLIDE under his direction, with the confidence that the blind man has in his guide.

The wind blew from north-north-eaſt to north; and, agreeably to the indication of the pilot, the ſhip was brought cloſe to the wind in order to keep the coaſt aboard.

At half paſt one o'clock in the afternoon, PEDRA BRANCA bore eaſt-north-eaſt half north, diſtant about four leagues; and, a little time after, was out of ſight. Captain MARCHAND regulated his courſe by the *Chart of part of the coaſt of China, &c.* publiſhed by ALEXANDER DALRYMPLE, a copy of which is to be found in D'APRES' *Neptune Oriental*, 2nd edition, No. 53.

113° 35′ 15″. *Robertſon* adds that its longitude was confirmed by nine ſets of aſtronomical obſervations (objects eaſt and weſt of the moon,) made by Captain *W. Fraſer;* whoſe mean of the whole places it in 115° 4′ eaſt. If we chooſe to take a mean between theſe two determinations, we ſhall have 115° 9′ 00″ eaſt from *Greenwich*, or 112° 48′ 45″ eaſt from *Paris: Robertſon* has adopted 115° 8′ 00″ from the meridian of *Greenwich*.

 The

The weather was overcaſt and miſty: at half paſt five o'clock in the afternoon, the pilot propoſed to come to for the night; and the anchor was let go in eighteen fathoms, over a bottom of ſoft mud; little SINGLE Iſland bearing north-eaſt half eaſt, and TOÑEANG Iſland north-eaſt by north, at the diſtance of two or three leagues from theſe iſlands; the GRAND LEMA ſouth-weſt.

On the 22nd, in the morning, Captain MARCHAND got under way with a freſh breeze at north-north-eaſt, and ſteered weſt-ſouth-weſt, in order to range along the ſouth coaſt of POO-TOY, and paſs to the northward of the GRAND LEMA. The ſhip had run eighteen miles to the weſt ſouth-weſt half ſouth: LING-TING Iſland bore weſt by ſouth, and the Iſland of POO-TOY, from north-north-weſt to north-north-eaſt, at the diſtance of half a mile, when he hauled his wind to ſteer for the Peak of LAN-TAO, and paſs to windward of LING-TING. But the wind came round to the north-north-weſt, at the ſame time blowing ſtrong: as it was no longer poſſible to weather the north ſide of this laſt-mentioned iſland, the pilot bore up in order to paſs it to the ſouthward.

Captain CHANAL remarks, that to the northward of LING-TING, are ſeen two ſhoals, even with the water's edge, which are not laid down on DALRYMPLE's chart: the diſtance from the moſt northern of theſe ſhoals to the iſland is rather more than a mile.

At half paſt noon, the SOLIDE was to the ſouthward of LING-TING; Captain MARCHAND hugged the wind, leaving on the larboard hand, to leeward, the SA-MOAN Iſlands and thoſe of Tsow, and ſteering for CHI-CHOW Iſland, in order to double it to the ſouthward: the wind blew ſtrong from the northward.

Quite close to the SA-MOAN and TSOW Islands, are seen some small islets, which are not laid down on the chart; but they are not dangerous.

In the mean time, the wind continued to scant more and more: and, although the ship carried all the sail that circumstances would allow, no hopes were entertained of her being able to weather some shoals, situated to the northward of the CHOOK-CHOW Islands, which the chart has not indicated. Captain MARCHAND determined to anchor under CHI-CHOW Island, where he came to, at a quarter past three o'clock, in thirteen fathoms, over a muddy bottom; the Peak of that island bearing north-north-east half east, one mile from its south-west coast; the most eastern of the CHOOK-CHOW Islands south-south-west half south; and the peak of the Island LAN-TAO north by east.

CHI-CHOW consists of two small islands close to each other; although, on the chart, these two islands are represented as one only.

On the 23d, the wind blew with too much violence, from north to north-north-east, for the SOLIDE to get under way: this day was spent at anchor, and the ship was thus detained, till the morning of the 25th, by an alternate contrariety of wind or tide.

The latitude of the anchorage was observed on the 24th, at noon, in 22° 3′ 30″ north: which places the south coast of the island in 22° 4′ or 5′ *. It was high water at eleven o'clock in the morning, at the distance of two

* I observe that, on *D'Après'* chart, N° 53, and on that of *Dalrymple*, of which it is a copy, the latitude of the south coast of *Chi-Chow* Island is 22°, and about *thirteen minutes*, that is, 8 or 9 minutes more northerly than that given by the observation on board the *Solide;* but on these same charts, *Macao* is placed in 22° 18′, that is, $5\frac{1}{2}$ minutes too much to the northward.

days from the new moon: the flood ſet to the weſt-north-weſt; and the ebb, to the eaſtward.

On the 25th, at ſix o'clock in the morning, the weather at length permitted Captain MARCHAND to get under way: the wind was moderate, and the firſt of the flood was favourable to the courſe: he made a ſhort ſtretch to the eaſtward; and, on putting about again, the ſhip looked up for the road of MACAO.

He ranged along the Iſland of LAF-SAM-MEE, which he doubled to the ſouthward; thence, he ſteered for that of CHUC-TUAN, which he paſſed, leaving it on the ſtarboard hand at a very ſmall diſtance: at the moment when it bore north, LAF-SAM-MEE bore eaſt-north-eaſt, and POTOE (TAILOW-CHOW on the Engliſh chart) weſt-ſouth-weſt. With the wind which had veered to the northward, blowing freſh, he paſſed between the ſmall Iſlands TAI-LOCK and SY-LOCK: the channel that they leave between them is narrow, and its middle is obſtructed by a ſmall rock, which is above water; but the pilot, by ſigns, gave our navigators to underſtand that there exiſts no hidden danger, and that a ſhip may, with ſafety, make free with both iſlands and the rock in the middle. The SOLIDE, in fact, paſſed very cloſe to SY-LOCK; to the eaſtward of this iſland, is ſeen a ſmall rocky iſlot, near which were found five fathoms water; and this is the ſmalleſt depth that was met with between the iſlands: near SY-LOCK, the ſoundings were eight fathoms.

After C. . . MARCHAND had paſſed the iſlands, he continued to hug the wind in order to fetch the anchorage of MACAO, for which he was ſteering; he was obliged to make a board to the eaſtward; and, at half paſt eleven o'clock, he dropped anchor in five fathoms and a half water, over a bottom of ſoft mud; the town of MACAO bearing weſt-north-weſt half weſt, diſtant

two

two leagues; the eaſt point of the ſouth peak of MONTANHA (Mountain) Iſland ſouth-weſt by ſouth; LING-TING Iſland north-north-eaſt half eaſt; and the peak of LAN-TAO eaſt north-eaſt half north. In this poſition, the latitude which was obſerved on this ſame day at noon, was 22° 11′ north.

The anchors came home in this firſt birth, with a freſh wind from north to north-north-eaſt. Two days after, Captain MARCHAND took another anchorage more to the northward, in ſix fathoms, with the ſame bottom as that of the former. The town of MACAO then bore west 8° ſouth, at the diſtance of two leagues.

As the SOLIDE had ſailed round the world in taking her route by the weſt, ſhe had loſt a day when ſhe arrived at MACAO, and Captain MARCHAND was obliged to change the computation of time; the day after his arrival, in lieu of reckoning Saturday the 26th of November, as he ought to have done in following the calculation of the ſhip from the period of her departure from MARSEILLES, he ſubſtracted that day from the calendar, and reckoned Sunday the 27th.

The news that Captain MARCHAND learnt at MACAO diſconcerted all the ſpeculations which the owners of the SOLIDE had in view in the expedition of their ſhip to the NORTH-WEST coaſt of AMERICA; and a failure, in the firſt inſtance, muſt have had an influence on every farther operation which depended on the ſale that would have taken place in CHINA. He was informed, on his arrival, that the Chineſe government had, under ſevere penalties, juſt prohibited all introduction of furs into the ſouthern parts of the empire, and particularly that of otter-ſkins. The rigour of this prohibition was pretty generally attributed to ſome ſtipulation made in favour of the Ruſſians, in the new treaty of commerce between the Emperor of CHINA

and

and the Empreſs of RUSSIA, a treaty that muſt neceſſarily have originated from the diſputes which had occurred latterly between theſe two powers, and which were known to have been terminated to the ſatisfaction of both; but ſome perſons who thought themſelves more clearſighted or better informed, conceived that the prohibition was to be imputed ſolely to the avarice and cupidity of the Mandarins. From whatever cauſe it aroſe, the prohibition ſubſiſted in all its force, and it even appeared impoſſible to be evaded. Already a Spaniſh ſhip, which had come from MANILLA with three hundred otter-ſkins, had been, from the impoſſibility that was experienced of dealing with the Chineſe traders, forced to depoſit her cargo in a ſtorehouſe, on which the ſenate, ſelf-denominated Portugueſe, but acting only at the voice or through the impulſe of a Mandarin, were obliged to cauſe the ſeals to be affixed: an Engliſh ſhip, likewiſe laden with furs, had, by going up to WHAM-POA or WAM-PU, attempted to elude the vigilance of the cuſtoms; but not having been able to procure the ſale of a ſingle ſkin, her commander reſolved to carry his whole cargo to ENGLAND: a Portugueſe brig and another Engliſh veſſel were expected from the coaſt of AMERICA with cargoes of the ſame kind, and it was ſuppoſed that a French ſhip which was to have been diſpatched from Port l'ORIENT, ſince the SOLIDE had ſailed from France, might have the ſame deſtination, and arrive at MACAO in the next ſeaſon. This union of unfavourable circumſtances left little hope of trading with advantage, even in caſe that the prohibition ſhould happen to be taken off during the SOLIDE's ſtay at MACAO; for the great competition of venders muſt neceſſarily have lowered the furs to ſuch prices that the ſale would yield a loſs rather than a profit.

Captain MARCHAND, however, before he came to any determination, waited till he received an anſwer from the correſpondents of the houſe of BAUX, ſettled at CANTON (QUANG-TCHEOU FOU), to whom he had written in order

order to procure more preciſe information; but this anſwer confirmed every thing that he had heard at MACAO: the impoſſibility of ſelling at CANTON the cargo of furs, on account of the prohibition; the inutility of going up to WHAM-POA, where the ſhip, although not of a conſiderable burden, would be taxed by duties, the ſum of which would amount to no leſs than ſix thouſand dollars. A tax ſo enormous was occaſioned by the want of activity of foreign trade; this year, there was ſcarcely reckoned in the port of CANTON, half the number of ſhips that had come to trade there the preceding year; and the Mandarin collector, being obliged to pour, annually, into the treaſury of the empire, an equal ſum, whatever may have been the produce of the cuſtoms, finds a very ſimple method of bringing this produce to a par with his obligation, and even, it may be ſuppoſed, of rendering it much greater; he doubles or triples, at his pleaſure, and according to circumſtances, the duties to be levied on ſhips that touch at CANTON. The Chineſe government, whatever encomiums may have been paſſed by ſeveral writers on the wiſdom of its adminiſtration, ſeems to be ſtill ignorant that the augmentation of duties does not promote the increaſe of the produce; and that, moſt frequently, a quite contrary effect muſt thence follow.

From the certain information which Captain MARCHAND had juſt received, he relinquiſhed every idea of a ſale, even by having recourſe to the channel of ſmuggling, the only one that remained open to him, and he reſolved to put to ſea as ſoon as poſſible, in order to proceed to the Iſle of FRANCE; where, according to the inſtructions of his owners, money would be tranſmitted to him for a further commercial operation.

The correſpondents of the houſe of BAUX had annexed to their anſwer, a memorandum of the prices at which furs had ſold the preceding year: it was there ſeen that the price of otter-ſkins of the firſt quality had not riſen to more

more than fifteen dollars. In comparing these prices with those of former years, which we learn from the detail given of them by the Editor of DIXON's Journal*, there appears a considerable decrease in the profits with which the Europeans flattered themselves from this new branch of commerce: in 1786, Captain HANNA had sold skins of this description at the rate of sixty dollars; in 1787, they had fallen to fifty; but, in 1788, Captain MEARES made them rise to seventy, and some even to ninety-one; though in the same year, and shortly after, those of Captains PORTLOCK and DIXON experienced a considerable decrease: the markets of CHINA were already abundantly supplied, and there was felt the inevitable effect of too large a stock: the skins, exported latterly, greatly exceeding the proportion of the wants foreseen, the new and the old were reciprocally depreciated.

But the taste of the Chinese for furs is so decided, so general, and this nation is so wedded to its habits, that it may be presumed, that, if the prohibition be not speedily taken off, the activity of the venders and the eagerness of the purchasers, seconded by the cupidity of a Mandarin, will find means to evade the law, as has happened with respect to the introduction of opium; and, the avenues being then open to smuggling, the prices will rise or fall alternately, in proportion to the difficulties, more or less great, which this illicit traffic may meet with.

Captain MARCHAND, during his stay at MACAO, had frequent occasions of experiencing the injustice and oppression of the Chinese government, of which there is no voyager who does not loudly complain, if he has made ever so short a stay in the only port of CHINA, the access to which is open to foreigners. Obliged to apply to a *Comprador*, or Chinese broker, for the

* *Dixon's Voyage*, page 316 and following.

purchase

purchaſe of their proviſions, which they are not permitted to procure for themſelves, they pay for every article double its value. The Portuguefe government of MACAO is in a ſtate of debaſement which can be compared only to the inſolence, the avidity, and the knavery of a Mandarin. There it is that are to be ſeen the conquerors of INDIA, the ſucceſſors of the great ALBUQUERQUE, in the dependence, and, in a manner, under the ferula of a Chineſe cuſtom-houſe officer, who, with the title of *Hoppo*, exerciſes a ſort of deſpotic ſovereignty; every moment, makes the rulers of ASIA kiſs the iron rod by which they are oppreſſed; and ſeems to revenge this part of the world, for the tyranny of the firſt Europeans that the ocean threw on its ſhores.

I ſhould deem it ſuperfluous to enter into any detail reſpecting the government, the manners, the cuſtoms, and the arts of the Chineſe: there is no voyager, no miſſionary, who has not, on this ſubject, filled whole volumes; and, probably, there is not one who has not ſaid too much good or too much ill of theſe various matters. We ſhould imbibe an opinion undoubtedly too unfavourable of them, if we were willing to judge of the empire and its two hundred millions of inhabitants, from the report of navigators, who all, from Commodore ANSON, have improved the one on the other, in order to paint by new touches, always more hideous, the diſhoneſty of the Chineſe government, which, according to their accounts, can be equalled only by that of the individuals to whom, ſays the philoſophic hiſtorian of the two INDIES, there no longer remains that ſhame common to all knaves, who chooſe to be ſo, but who do not ſuffer people to tell them of it*. But navigators abſolutely inſiſt that we ſhould judge of all CHINA, by the city of CANTON, the only one

* Raynal, *Hiſtoire Philoſophique et Politique des Etabliſſemens et du Commerce des Européens dans les deux Indes.*

of which they can get a glimpſe, and into which they are not allowed to penetrate but with formalities that would render null the talents of the obſerver the moſt clearſighted, and the moſt habituated to form, by a rapid glance, a judgment of men and things. In reading what they they ſay of CHINA, we recall to mind, in ſpite of ourſelves, that well-known anecdote of a traveller, who having, in an inn, had an altercation with the miſtreſs of the houſe, that was red-haired and ill-tempered, noted down in his common-place book, that all the women of the country were ill-tempered and red-haired. How can EUROPE ever fix its opinion reſpecting an immenſe empire, alike ſhut againſt ſtrangers who have not the liberty of entering it, and againſt the natives who have not that of coming out of it? Perhaps, in order to ſucceed in forming an idea that would come near the truth, we muſt wait, as RAYNAL ſays, till permiſſion be given to diſintereſted and judicious men, deeply verſed in the language, both as to writing and ſpeaking it, to make a long ſtay at the court of PEKIN, to viſit the provinces, to inhabit the country-places, and converſe freely with the Chineſe of all ranks*. The enumeration of every thing that would be neceſſary for bringing us acquainted with CHINA, naturally leads us to pronounce, that we ſhall never know it otherwiſe than as we lately knew the inſide of a convent, from having been admitted ſometimes into the parlour.

During the SOLIDE's ſtay in MACAO road, three Engliſh Eaſt-Indiamen paſſed by without ſtopping, and continued their route in order to proceed to EUROPE. Captain MARCHAND availed himſelf of this opportunity of writing to his owners, and of addreſſing to them the particular chart of the ILES DE LA RÉVOLUTION which he had diſcovered, on the 22d of June 1791,

* Raynal, *Hiſtoire Philoſophique et Politique des Etabliſſemens et du Commerce des Européens dans deux Indes.*

to

to the north-weſt of the group of LAS MARQUESAS DE MENDOÇA. We are certain that this chart reached FRANCE, and that the houſe of BAUX laid it at the feet of the national Aſſembly upwards of four months and a half before the SOLIDE's return; for, on the 17th of April 1792, the chart was preſented to that aſſembly, which decreed that honourable mention ſhould be made of it in the verbal-proceſs of that day *.

About the ſame time, arrived in the road an American brig, an officer belonging to which came to beg Captain MARCHAND's permiſſion for the ſurgeon of the SOLIDE to go on board of this veſſel, in order to give his advice to the captain who was ill. Captain CHANAL, being directed to repair thither with Surgeon ROBLET, for the purpoſe of offering to the American captain every aſſiſtance in the French captain's power, had an opportunity of learning the object and the ſucceſs of this veſſel's voyage.

She had ſailed, fifteen months before, from NEW ENGLAND. In the beginning of May 1791, ſhe had put into the Bay of LA MADRE DE DIOS

* Captain *Chanal* has procured, from the Archives of the Republic, an extract from this verbal-proceſs, which I tranſcribe from the original that he put into my hands.

ARCHIVES OF THE FRENCH REPUBLIC.

" *Extract from the verbal-proceſs of the National Aſſembly, of the 17th of April* 1792, *4th year of Liberty.*

" A Member preſents to the Aſſembly a chart of ſeveral iſlands, newly diſcovered in the " Indian ſeas by the Sieur *Marchand*, of Marſeilles, commander of the ſhip *Solide*, diſpatched " to the South Sea, by Meſſrs. J. and D. *Baux*, ſhip-owners; he moves that honourable mention " ſhould be made of this offer. The propoſition is decreed.

" *Collated and found conformable to the Original depoſited in the Archives of the French* " *Republic, by me, Keeper of the Archives; in witneſs whereof I have ſigned and cauſed* " *to be affixed the ſeal of the ſaid Archives. Paris, fifth Ventoſe, year five of the French* " *Republic one and indiviſible.*"

Signed to the Original, CAMUS.

in the Iſland of SANTA CHRISTINA of the MARQUESAS DE MENDOÇA; but her boats had not been ſent on ſhore, and ſhe had received on board wood and water, which the natives had brought in their canoes. On quitting this bay, and ſtanding to the north-weſt, the American Captain had diſcovered a group of *nine* iſlands on which he had impoſed names; but he had not ſtopped there, and had not even detached a boat to examine them cloſely and viſit them: he had contented himſelf with having a view of them, and had not thought himſelf bound to deviate from his route for the purpoſe of acquiring a more particular knowledge of them.

From the latitude which the American captain gave to the iſlands which he had ſeen; from their relative poſitions with reſpect to each other, and to the MARQUESAS DE MENDOÇA, Captain CHANAL could not doubt that the REVOLUTION Iſlands, which Captain MARCHAND had diſcovered in the month of June of the ſame year, were the ſame as thoſe which the American captain had perceived in the month of May; or that at leaſt the REVOLUTION Iſlands made part of theſe latter; "for," ſays Captain CHANAL, "Captain "MARCHAND reckoned only *four* principal iſlands, while the American cap- "tain reckoned *nine* in the group which he diſcovered."

I cannot entirely adopt the opinion of Captain CHANAL: I am perſuaded, as he is, that the group of the American is the ſame as that of the French captain; but I think that he has not rightly underſtood the captain of the brig, and that, when he ſaid that his group is compoſed of *nine* iſlands, he meant that the group of the MARQUESAS DE MENDOÇA of which till now five iſlands only, LA MADALENA, SAN PEDRO, SANTA CHRISTIANA, LA DOMINICA, and HOOD's Iſland, have been reconnoitred, is compoſed of *nine*, by the addition of the *four* new iſlands which he has diſcovered to the

the north-weſt of the former MARQUESAS; and on what follows I ground my opinion:

If the reader caſt his eye on the large planiſphere which the Engliſh geographer ARROWSMITH publiſhed in 1794, he will ſee to the north-weſt of the MENDOÇA Iſlands, a new group ſituated with reſpect to thoſe iſlands, as is, in regard to them, the REVOLUTION group: both occupy about a degree and three-fourths in latitude; both are compoſed of four principal iſlands and of a few iſlots or rocks: and if we did not read Engliſh names in the place of French names, we might ſuppoſe that ARROWSMITH has had a knowledge of the group of the REVOLUTION Iſlands, diſcovered by Captain MARCHAND, and which he has inſerted in his planiſphere, from ſome plan where theſe iſlands were not regularly placed, but merely ſcattered at hazard. In comparing the group delineated by the Engliſh geographer with that of which Captain CHANAL has conſtructed the chart, and in carrying the eye, in this compariſon, along both groups from ſouth-eaſt to north-weſt, it is ſeen that the ſmall iſland, called RIOU's Iſland by the Engliſh, is the little ILE PLATE of the French; that TREVENNEN's Iſland of the former is ILE MARCHAND of the latter; that SIR HENRY MARTIN's Iſland, the largeſt of ARROWSMITH's group, is ILE BAUX, the largeſt of MARCHAND's group; that the two rocks called HERGEST's ROCKS by the Engliſh, are the rocks called LES DEUX FRÈRES by the French; and that, in ſhort, the two moſt northern iſlands, which lie north-eaſt and ſouth-weſt, with reſpect to each other, under the ſingle name of ROBERT's ISLANDS, are ILE MASSE and ILE CHANAL, which have between them the ſame bearing as the former, and whoſe diſtance is the ſame on the two charts. It therefore appears to me proved, that if, as we muſt ſuppoſe, the new group which is ſeen on ARROWSMITH's planiſphere, to the north-weſt of the MARQUESAS DE MENDOÇA, is that which the American captain diſcovered, this group is compoſed of a number of iſlands

equal to that of the REVOLUTION Iſlands; and that if this Captain has ſaid that the group which he ſaw is compoſed of *nine* iſlands, he meant to ſpeak of the whole archipelago of the MARQUESAS, of which the *four* new iſlands (that we reckon for *five*) are only an integral part, which, added to the *five* old iſlands, diſcovered by MENDANA, and found again by Captain COOK, form, in fact, that archipelago compoſed of *ten* iſlands*, which the hydrographer of the iſlands of the GREAT OCEAN, TUPIA, had delineated on his chart, before any modern navigator had explored the portion of that archipelago formerly diſcovered by MENDAÑA.

The ſcale of ARROWSMITH's planiſphere is too ſmall for us to be able to take, with any degree of preciſion, the latitude of each of the new iſlands in particular, as well as their relative differences of longitude, and to compare them afterwards with thoſe which are aſſigned to them by the obſervations made and bearings taken by Captains MARCHAND and CHANAL; but, admitting that there are differences rather conſiderable in the latitudes, in the longitudes, and, conſequently, in the bearings and diſtances, theſe

* It appears that the American Captain has not reckoned in the number of his iſlands the ſmall iſland called, by the Engliſh *Riou's* Iſland (our *Ile Plate*); and the new group is thus compoſed, according to him, of only *four* iſlands (the four principal iſlands of thoſe reconnoitred by *Marchand*), which, with the five *Mendoça* Iſlands, compoſe his whole group of *nine* iſlands that we carry to *ten*, reckoning our *Ile Plate* for one.

The following note is taken from the *Additions* to Vol. I. of the original 4to edition.—*Tranſlator.*

"Thus I reaſoned," ſays M. FLEURIEU, "before I had read an account of the complete ſurvey which Lieutenant *Hergeſt* made, in 1792, of the group ſituated to the north-weſt of the *Marqueſas de Mendoça;* but it may be ſeen, in the *Additions to the Voyage*, that, without reckoning our little *Ile Plate* for any thing but an iſlot or a rock, the *north-weſt* group is, in fact, compoſed of *ten* iſlands, as I had ſuppoſed, becauſe Captain *Marchand*, from the route which he followed in ſight of theſe iſlands, could not perceive one of them, ſituated 7 leagues to the eaſtward of his *Ile Baux*, and which was called *Riou's* Iſland by Lieutenant *Hergeſt*."

differences

differences do not deſtroy the proofs of the identity of the groups: for it is well known that the American captain had, as it were, only a glimpſe of his, in paſſing, and could, at moſt, but give a ſketch of it; whereas Captain MARCHAND, by numerous obſervations and bearings, has aſcertained, on the one hand, the latitudes and the relative ſituations of the iſlands which compoſe the REVOLUTION group; on the other, their poſition with reſpect to the group of the MARQUESAS; and as Captain CHANAL has conſtucted a chart of it with the authorities of which his journal has made us acquainted.

Captain MARCHAND, undoubtedly, cannot aſpire to the honour of priority; but he has not, on that account, like the American captain who anticipated him, the leſs pretenſion to the honour of the diſcovery; for he could not know, in the month of June 1791, while he was navigating in the GREAT OCEAN, that a month before, another navigator, ſtanding the ſame courſe with himſelf, had made the ſame diſcovery. We muſt, however, grant to the French Captain an additional merit, that of having made known to us the natives of the new iſlands, and of having fixed the geographical poſitions of this group with an exactneſs ſufficient for the ſafety of navigation.

I muſt not omit that the American Captain mentioned to Captain CHANAL, that, during his navigation in ſight of the new iſlands, he conſtantly perceived, to leeward, an appearance of land, the form, the diſtance, and the poſition of which had not varied all the time that he was abreaſt of theſe iſlands. This remark, conformable in all points to that which was made on board of the SOLIDE, in the ſame track of ſea, and in the ſame ſituation, ſeems to afford nearly the certainty that, to leeward of this new group, there exiſt other lands ſtill unknown.

Captain

Captain CHANAL, in his converſation with the captain of the American brig, picked up a few other particulars of his voyage, which will not appear foreign to that of Captain MARCHAND.

This veſſel had traded for the fifteen hundred furs which ſhe brought to CANTON, partly on the coaſt of AMERICA, to the ſouthward of QUEEN CHARLOTTE's Iſlands, partly along the weſt coaſt of thoſe iſlands; but ſhe had proceeded no farther to the northward than CLOAK BAY, and had employed only forty days in carrying on her trade. Her voyage preſents no diſcovery in that quarter.

During the ſtay which, on his return from the NORTH-WEST coaſt, the American Captain had made at ATOOI, the moſt northern and the largeſt of the weſt group of the SANDWICH Iſlands, he had received on board his veſſel two ſailors, who, two years before, had been carried off from an Engliſh brig by the natives of the iſland, and were obliged to employ no ſmall ſhare of cunning to effect their eſcape. Theſe two men reported that they had been well treated; but they affirmed that they had been convinced with their own eyes, that thoſe iſlanders are cannibals, and eat their priſoners. I know not what degree of confidence ought to be granted to the teſtimony of theſe two ſailors; but, it appears, on the other hand, that Captain COOK, Lieutenant KING, Surgeon ANDERSON, and ſeveral of the officers belonging to the RESOLUTION and the DISCOVERY, who had made it their particular buſineſs to inquire whether the natives of the SANDWICH iſlands ought to be accuſed of cannibaliſm, were never able to obtain the certainty of the fact; and if they have not been willing to pronounce the negative, at leaſt they do not ſuffer it to be doubted, that they were ſtrongly inclined to repel this horrible accuſation. I leave others to judge whether the teſtimony of two ſailors, however poſitive it may appear, be ſufficient for deciding a queſtion

queſtion, which obſervers, no leſs intelligent than enlightened, and particularly bent on inquiries which might fix their opinion on this point, have not ſucceeded in clearing up. Have theſe ſailors ſeen diſtinctly? Have they faithfully reported what they ſaw? Have they not wiſhed to make a ſort of merit, have they not thought to give themſelves a degree of conſideration and importance, in announcing themſelves as men who had eſcaped the tooth of cannibals? They may, beſides, probably have been deceived by appearances: for it is well known, that the cuſtom of the natives of the SANDWICH Iſlands is to cut in pieces the bodies of their dead enemies, which they have been able to ſeize on, to burn their fleſh, and to preſerve their bones as trophies, which are to perpetuate the memory of their exploits. Thus it was that they dealt with the body of the unfortunate COOK. When Captains CLERKE and GORE, Lieutenant KING, and the other companions of that heroic navigator, claimed the remains of their HECTOR, and had obtained that they ſhould be reſtored to them, theſe remains were wrapped up in a large quantity of fine new cloth, and covered with a ſpotted cloak of black and white feathers*. "We found in the bundle," ſays KING, "both the hands of Captain COOK entire, which were well known from "a remarkable ſcar on one of them, that divided the thumb from the fore-"finger, the whole length of the metacarpal bone; the ſkull, but with "the ſcalp ſeparated from it, and the bones that form the face wanting; "the ſcalp, with the hair upon it cut ſhort, and the ears adhering to it; the "bones of both arms, with the ſkin of the fore-arms hanging to them; "the thigh and leg-bones joined together, but without the feet. The "ligaments of the joints were entire; and the whole bore evident marks "of having been in the fire, except the hands, which had the fleſh left "upon them, and were cut in ſeveral places, and crammed with ſalt, ap-

* *Cook's third Voyage.* Vol. III. page 79.

" parently with an intention of preſerving them*." The Engliſh alſo claimed the bodies of the marines who had been killed; but the natives explained that the common people had ſhared their members among them, and that they were irrecoverable: they added that they would bring the remaining bones of the captain, " theſe alone having been preſerved as " belonging to TERREEOBOO (the principal chief of the iſland) and the " *Earees* †." In the whole courſe of this melancholy treaty, the Engliſh gathered no indication which could make them ſuſpect that their unfortunate companions had ſerved as food to their murderers: we merely diſcover, in the eagerneſs of the chiefs to poſſeſs ſome portion of a being who had ſeemed to them ſupernatural, whom they thought invincible, perhaps even invulnerable, and who had fallen under the dagger which he himſelf had forged, we diſcover, I ſay, that deſire natural to warlike and half-ſavage iſlanders, to poſſeſs a monument of their victory, a teſtimony of their valour. Perhaps too ſuperſtition is blended with this ſentiment of pride; perhaps, after having deified Captain COOK in his life-time, they wiſhed, by ſharing his mortal part, to preſerve his remains in the nature of taliſmans, or to expoſe them, as relics, to the veneration of the people. Be this as it may; nothing proves, nothing indicates that the natives of the SANDWICH Iſlands are cannibals; and we ſhould not be juſtified in concluding that they are ſo, becauſe they ſacrifice men in certain ceremonies: the Taheiteans alſo ſacrifice men, and yet are not cannibals; while the inhabitants of NEW ZEALAND, who, no doubt, are leſs ſuperſtitious and more cruel, eat men, but ſacrifice none. The natives of the SANDWICH Iſlands have prieſts; they therefore have ſuperſtitions; and human ſacrifices have been in uſe among all nations over whom ſuperſtition has reigned; madmen as they were, they imagined that the blood which they ſhed was to appeaſe the angry

* *Cook's third Voyage.* Vol. III. page 79. † *Ibid*, page 81.

3 divinity,

divinity, or obtain from his power ſignal protection, and the aſſurance of victory, if they marched to battle: but hiſtory, which has handed down to us the recital of theſe horrible burnt-offerings, does not tell us that the people who ſacrificed men, carried their blind fury ſo far as to devour their fellow-creatures; one of theſe horrors is not inſeparable from the other.

If, however, it were true that the inhabitants of the SANDWICH Iſlands were cannibals, let us hope that their frequent communications with Europeans (which, in other reſpects, may be ſo fatal to them) by ſoftening their ſtill ferocious manners, will be the means of cauſing them to renounce their execrable feſtivals. Captain COOK, who, in the Iſland of TAHEITEE, had been witneſs of a human ſacrifice, flattered himſelf that the horror with which he had inſpired the Taheiteans for theſe homicidal ceremonies, would aboliſh the uſe of them for ever: would it then be more difficult to perſuade the former that, if it is repugnant to Nature to ſacrifice a man, it is ſtill more repugnant to her to feed on his fleſh? Ah! no doubt, the glory the moſt to be coveted, the ſweeteſt fruits that Europeans ought to promiſe themſelves from their long voyages, would be, that, in viſiting every part of the inhabited earth, they might every where be able to recall the ſavage to the dignity of man, and deſtroy, over the whole ſurface of the globe, the abominable remains of cannibaliſm! In favour of ſo great a benefit, the philoſopher might forget ſome of the outrages which Europeans, in diſcovering the world, have done to humanity.

The Captain of the American brig, during his ſtay at the SANDWICH Iſlands, had received on board four natives belonging to thoſe iſlands, who had offered to accompany him; but it appears that they had been ſoon diſguſted with a kind of life ſo different from that of an iſlander of the GREAT OCEAN. One of theſe who had come on board of the SOLIDE, when

the ſhip lay to abreaſt of the Iſland of O-WHYHEE for the purpoſe of procuring refreſhments there, recollected at MACAO Surgeon ROBLET, whom he earneſtly, and repeatedly intreated to take him on board the French ſhip: this requeſt could not be complied with; though he knew not that to him it would have been only to change his priſon. A native of the SANDWICH Iſlands muſt with difficulty accuſtom himſelf, or rather would never accuſtom himſelf, to a ſtate of dependence and obligatory labour: curioſity may probably lead him to ſeek employment in the ſervice of Europeans who are to him a new race of men, and muſt appear to him extraordinary and ſuperior, when he compares their induſtry to his own: but if he have attained a certain age, if he have already known how to appreciate liberty, the life of a ſailor is not calculated for him; ſhortly will he regret his iſland, his woods, and his hut; and as ſoon as he has it in his power, he will return to his home, *revertet ad ſuos*.

Captain CHANAL was informed by the American Captain, that the three-maſted veſſel, perceived from the SOLIDE off BERKLEY SOUND, and which had been ſuſpected to be one of the frigates that the Spaniſh government, under the appearance of a voyage of diſcovery, had diſpatched to watch the conduct and the operations of the Engliſh, was a ſhip belonging to the UNITED STATES, and was to winter on the coaſt: an officer of this ſhip and ſome of her people had fallen victims to the fury of the ſavages, in a harbour ſituated to the ſouthward of NOOTKA SOUND. He likewiſe learnt that the brig which had been perceived to the eaſtward of Cox's Channel, was an American, and that he had left on the coaſt, another brig and a ſchooner of the ſame nation. Theſe three laſt-mentioned veſſels were to come this year to CHINA, and intended to return to the NORTH-WEST coaſt of AMERICA; they had left there a boat, which, during the winter, was to be employed in collecting, for the following year, the quantity of ſkins neceſſary for forming

their

their cargoes. The ſchooner, in her way to the coaſt, had anchored at O-WHYHEE: the natives had killed two of her people; and the veſſel had been forced to cut her cables and make ſail, for fear the natives, too ſtrong in number, and become too enterpriſing, ſhould ſucceed in getting her into their poſſeſſion.

Theſe different accounts ſufficiently ſhew that the Americans of the UNITED STATES, whoſe navigation and commerce are daily acquiring freſh extenſion, have ſeized with ardour, and without being diſcouraged by the diſtance, the new ſupport which the peltry of the NORTH-WEST coaſt of AMERICA offers to their ſpeculations, to their induſtry, and to their want of enriching themſelves in order to pay the public debt: to the nations of EUROPE, they are become formidable competitors; and their activity is by no means inferior to that of the Engliſh. It is well known too that the Spaniards, under the name of the PHILIPPINE Company, are endeavouring to rival both; and even the Portugueſe of MACAO, rouſed from their lethargic languor by the ſeducing allurement of the enormous profits that the firſt operations have yielded, have attempted to engage in the new career which had juſt been opened to cupidity. Thus, EUROPE, ASIA, and NORTH-EAST AMERICA, by a ſimultaneous movement, have directed their ſhips towards the NORTH-WEST coaſts of the New World, and vied with each other in multiplying, without principles as well as without prudence, their bold ſpeculations.

But the fur-trade has limits fixed by nature and by reaſon: ſpeculations ought, on the one hand, to be combined with the population of a country far from favourable to the multiplication of men, and with the time neceſſary for the reproduction of the animals againſt which they make war, and for whoſe ſkins trade is waiting; on the other hand, with the annual conſump-

tion

tion that may be made of these furs, when the introduction of them is free, by the people of that empire of ASIA, to which the total produce of the trade of AMERICA is consigned.

Before the voyages of our time had made known the part of the NORTH-WEST coast, comprised between the fiftieth and sixtieth parallel north, RUSSIA had already created this trade; and it seemed likely to be to her a sort of exclusive property, which her geographical position might insure. The English carried to ST. PETERSBURG, as they still carry thither at this day, their peltry from CANADA and HUDSON's Bay: thence, taking the road of the interior, partly by land, partly by the lakes and rivers, and augmented on the route, by the addition of the furs furnished from SIBERIA, and by those which the navigation of the Russians has procured them, since they have discovered the Archipelago of the KURILES, that of the ALEUTIAN Islands, and the continent of AMERICA above the sixtieth parallel, all these furs assembled arrived, after a passage of several months, at the frontier town of KIATCHTA*, the mart of the Russians; and traffic was open with MAIMATSCHIN †, the town, or the market of the Chinese, which is separated from the former only by the rivulet of KIATCHTA. From MAIMATSCHIN the furs reached PEKIN, and thence were distributed throughout the whole

* *Kiatchta* is situated a little to the northward of the *fiftieth* parallel; and it is an error of the press which places it in the latitude of *thirty-five* degrees, in the estimable work of *William Coxe*, entitled *Account of the Russian Discoveries between Asia and America*. London, 1780. 4to. page 212.

† "The frontier town of *China*," says *Coxe*, page 214 of the work quoted in the preceding note, "is called by the Chinese and Mougols, *Maimatschin*, which signifies *fortress of commerce*;" but the Chinese have another emporium, that of *Zuruchaita*, alike situated on the frontier of *Siberia*, on the western branch of the river *Argoon*, 12° 40′ more to the eastward, and about a degree less to the northward than *Kiatchta*. "Formerly the commerce carried on at *Zuruchaita* "was considerable; but at present it is so trifling that it hardly deserves to be mentioned; almost "the whole traffic between *Russia* and *China* is confined to *Kiatchta*." (*Russian Discoveries, by W. Coxe*, page 244 and 245.)

empire.

empire. It is eaſy to conceive that the new introduction of furs by ſea and the ſouthern ports of CHINA, by calling the Engliſh, the Americans, the French, the Spaniards, and the Portugueſe to a ſhare of this trade, by occaſioning them to enter into competition and rivality with the Ruſſians, muſt make the merchandiſe that is the object of it, fall to prices which no longer hold out a ſufficient profit to excite and maintain the activity of freſh ſpeculations.

It may therefore be foreſeen, that the maritime nations will do each other a mutual prejudice, by crowding too much to the markets of CHINA; at the ſame time that they will reciprocally injure one another in their purchaſes, by a too great reſort to the NORTH-WEST coaſt of AMERICA. Doubtleſs, they have already perceived that, if they are deſirous of preſerving this valuable branch of trade, and of preventing it from drying up in their hands, they muſt not require from it more fruit than it can yield without being exhauſted. Let them haſten then, if yet it be time, let them haſten to relax and arrange their hitherto diſorderly operations, in order to regulate their extent by the quantity of furs which it is poſſible to draw annually without drying up their ſource, and by the preſumable proportion of the vents that may be open to the general produce of the trade. The intereſt of commerce and that of the ſciences are here blended; and we muſt wiſh that a conduct far from rational and diſappointed hopes, may never force the Europeans to interrupt that intereſting ſucceſſion of voyages into the GREAT OCEAN, which, by multiplying, in every direction, the tracks of our ſhips, muſt indubitably, and in the courſe of a few years, perfect the deſcription of the parts of the globe little known, and obtain a freſh increaſe to the ſtock of our knowledge.

CHAPTER

CHAPTER VIII.

Departure from Macao.—*Passage of the* China Sea.—*Rectification of the Chart of that Sea.—The* Solide *passes through* Gaspar's *Strait between the Islands of* Banca *and* Billiton.—*New Plan of the two Straits which present themselves between these islands.—These Straits preferable to that of* Banca.—*Navigation from* Gaspar's *Strait to the Isle of* France.—*Arrival at* Port du Nord-Ouest *(Port North-west) in this last-mentioned island.—Transactions there.*

The Solide set sail from Macao Road for the Isle of France, on the 6th of December, at half past ten o'clock in the evening, and directed her course so as to strike soundings on the Macclesfield Bank, situated towards the latitude of 15° 45′ north, in the middle of the China Sea.

On the 8th, at eight o'clock in the morning, soundings were struck on it, in sixty-five fathoms, the bottom broken shells, mixed with small black and white gravel. Two hours before, no ground could be reached with a line of eighty fathoms.

Having ascertained the situation of the ship by these soundings, which Captain Marchand could not doubt to belong to one of the limits of the bank, he steered south-west in order to get sight of Pulo-Sapata, small islands situated towards the tenth parallel north, about the distance of forty-two leagues from the south-east point of the kingdom of Camboja.

On the 11th, a little time after noon, the sea, which till then had been rough, fell all on a sudden; and it was not without great surprise that, at forty

forty minutes paſt four in the afternoon, he perceived to the weſt by ſouth, at the diſtance of about five leagues eſtimated by the eye, an iſland in a ſituation where, by the courſe which the ſhip had ſteered, none ought to be met with.

According to the latitude of 11° 14′, which had been obſerved at noon, and the run which the ſhip had made ſince that moment, the land that was in ſight could be only the iſlands called the Two Brothers, ſituated on Alexander Dalrymple's Chart of the China Sea, at the diſtance of eleven leagues weſt by north 3° weſt from the moſt eaſtern of the Pulo-Sapata.

Although the land that was perceived could be no other than the Two Brothers, yet there remained ſome uncertainty in this reſpect; becauſe on the ſuppoſition that it was the Two Brothers, the ſhip ought to have paſſed ſo near to the moſt ſouthern iſlands of thoſe which compoſe the Paracels, that it would have been impoſſible for our navigators not to have ſeen them, and yet not one of them had been perceived. On conſulting the Table of geographical poſitions inſerted in the *Connoiſſance des Temps*, (French ephemeris, or nautical almanac), which gives the longitude of Pulo-Sapata, as it was determined by the obſervations made in Cook's third voyage, Captain Marchand thought he diſcovered that this iſland is placed, on Dalrymple's chart, about 1° too far to the weſtward: and as the Two Brothers muſt have been laid down there from their bearing and diſtance in regard to Pulo-Sapata, he judged that the error of their poſition muſt be the ſame as that of the poſition of theſe latter iſlands. From the moment that he had perceived the Two Brothers, he ſteered ſouth-weſt and ſouth-weſt by ſouth; and at ſix o'clock, they bore from weſt 26° north to weſt 45° north. He then ſtood on to get ſight of the largeſt of the group of the

PULO-SAPATA; and about midnight, by the help of the moon, he discovered it to the south-west by west. This island is small and barren, but high land; and its form, which is that of a *shoe*, as its name indicates*, admits not of mistaking it and confounding it with another island †: in clear weather, it may be seen ten or eleven leagues from the deck of a merchant-ship. He steered so as to round it at a suitable distance; and at three quarters past midnight, it bore directly west, distant four or five miles.

This remark of Captain CHANAL has appeared to me to deserve to be examined with attention, because it points out two corrections to be made: the one in the *Chart of the China Sea* by ALEXANDER DALRYMPLE, a copy of which is to be found in the second edition of the *Neptune Oriental* of D'APRÈS DE MANNEVILETTE, and on which all the French navigators regulate their course in the CHINA SEA; the other on the *General Chart of the World*, by Lieutenant ROBERTS, which accompanies the account of Captain COOK's third voyage. The error in DALRYMPLE's chart lies in the longitude of PULO-SAPATA, reverts on that of the TWO BROTHERS, and is owing to the difference of meridian, on this chart, between PULO-SAPATA and MACAO being too great by 50 minutes of a degree ‡. The error in the chart of COOK's third voyage consists in its placing the TWO BROTHERS to the north about 40° *east* of PULO-SAPATA; whereas, by the route which the SOLIDE followed, in passing from the former islands to the latter, the TWO BROTHERS must be situated to the north about 22° *west* of PULO-SAPATA, nearly in the position in which they are seen on DALRYMPLE's chart §. I refer

* *Zapato* and *Çapato*, shoe, in Spanish and in Portuguese.

† "When *Pulo-Sapata* bears north," says *George Robertson*, "it is extremely curious in appearance, and looks as if it were going to fall to the right; both sides in that point of view stand a great way off their centre." (See *Memoir of a Chart of the China Sea*, &c. London, 1791, 4to. page 6).

‡ Note LX.

§ Note LXI.

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the reader to the *Notes* which are to be found at the end of this narrative, for the detail of the combinations, calculations, and trigonometrical operations, by which I have endeavoured to determine the quantity of this error. The excellent *Memoir* which G. Robertson publiſhed in 1791, for the elucidation of his capital *Chart of the China Sea*, has been very uſeful to me for the firſt of the corrections to be made; and if my reſults differ ſometimes from his, I am not the leſs indebted to him for a great number of *data*, with which his inquiries have furniſhed me, but which have not always led me to the ſame conſequences that he thought he might draw from them. The diſcuſſion in which I was involved by the combination of theſe various data, has put me in the way of treating of the poſition of ſome points of the China Sea, which it was important to fix with the preciſion neceſſary for leſſening the perils of navigation, in a ſea where the currents which maſter ſhips, leave a great uncertainty reſpecting their direction and velocity, and where iſlots, ſand-banks, and dangers of all ſorts preſent themſelves every moment.

Captain Marchand took his departure from Pulo-Sapata, which he ſuppoſed ought to be placed in the latitude and longitude deduced from the obſervations made in Cook's third voyage; and he directed his courſe to the ſouth-weſt, in order to make Pulo-Timoan.

He had the firſt view of it to the ſouth-ſouth-weſt, on the 15th at ſix o'clock in the morning, at the moment when the ſoundings were thirty-eight fathoms, over a bottom of rather hard mud; and at eight o'clock, Pulo-Timoan bore ſouth-ſouth-weſt, and Pulo-Piſsang ſouth half-weſt. This latter iſland is the largeſt of a group ſituated near the Malay coaſt, between the parallels of 2 and 3° north, and compoſed of the Islands or *Pulo*, Varela, Aor, Timoan, Piſsang and Tingi: Piſsang is a high land, which may be diſcerned at the diſtance of twenty or twenty-one leagues.

Clouds did not admit of obſerving the meridian altitude of the ſun; but at three quarters paſt two o'clock, PULO-AOR (or PULO-LAOR, according to D'ANVILLE*) was ſeen at the diſtance of four leagues and a half, bearing ſouth-ſouth-weſt. The eaſt part of this little group preſents very high land, forming two hills, which lie in regard to each other ſouth-eaſt and north-weſt, the moſt eaſterly of which is the higheſt. Its geographical poſition was determined by the obſervations made in COOK's third voyage, which fix its latitude at 2° 42″ north, and its longitude at 102° 19′ 45″ eaſt from PARIS †: on deducing the poſition of the ſhip from the bearing of PULO-AOR, we find that her latitude muſt have been 2° 56′, and her longitude, 102° 26′; but the dead reckoning from the laſt bearing of PULO-SAPATA, on the 11th at three-quarters paſt midnight, gave 3° 17′ for the latitude, and 103° 19′ for the longitude; and thence it was concluded that, in the interval from the 11th to the 15th, the currents had carried the ſhip 21 minutes to the ſouthward, and 53 minutes to the weſtward.

I muſt apprize French navigators that the ſituation of PULO-AOR, on the chart No. 49 of D'APRÈS' *Neptune Orientale* (ſecond edition) is not conformable to the reſults of the obſervations made in COOK's third voyage: if theſe be admitted, the latitude which on the chart is only 2° 30′, muſt be increaſed about 12 minutes; and on the general chart, No. 9 of this Collection, where

* And according to the natives of the Iſland *Pulo-Warwoor*.

		°	′	″	
† Latitude	According to *King*	2	40	00	Mean 2° 42′ 00″ North.
	According to *Bayly*. . . .	2	44	00	

Eaſt from *Paris*.

Longitude	According to *King* . .	102	16	45	Mean 102° 19′ 45″ Eaſt from *Paris*.
	According to *Bayly*. .	102	22	45	

See *Original Aſtronomical Obſervations made in a Voyage to the Northern Pacific Ocean*, &c. page 351.—*See* alſo Note LX. at the end of this narrative.

the

the latitude is the ſame as on the particular chart, No. 49, the longitude, which is only 102°, muſt be carried to 102° 20′ *.

When the SOLIDE had doubled PULO-AOR, ſhe ſteered ſouth-ſouth-eaſt, in order to paſs without the DOOGER'S BANKS, which are ſaid to be dangerous, and the poſition of which is ſtill uncertain †.

On the 17th, about nine o'clock in the morning, land was perceived to the ſouth-ſouth-weſt. It was ſuppoſed, according to the calculation made of the ſhip's run, that this muſt be a ſmall iſland without a name which D'APRÈS' Chart, No. 49 (2nd) places a league and a half to the eaſtward of the eaſt point of LINGIN Iſland: Captain MARCHAND ſtood to the ſouth-ſouth-eaſt, in order to double the ſmall iſland; but ſqualls and rain preſently concealed it from his view. At three quarters paſt ten, he ſounded in twenty fathoms water, over a bottom of ſand and ooze.

* In making this criticiſm on *D'Après'* two charts which I have deſignated, I ought not to neglect to inform the reader that *George Robertſon*, as well as the French hydrographer, employs on his great chart of the *China Sea*, the latitude of 2° 30′, and that it is the ſame on *Alexander Dalrymple*'s chart. Moſt aſſuredly, *Robertſon* was unacquainted with the obſervations of *Cook*'s voyage, which are conſiderably prior to the publication of his chart, but later than that of *Dalrymple*'s chart, and yet he has not employed their reſult: nor has he explained himſelf in regard to the motive that may have determined him not to make uſe of it; but merely ſays, (page 9 of his *Memoir*) that the latitude of *Pulo-Aor* or *Pulo-Auro* is between 2° 29′ and 2° 30′ north. (See Note LX.)

† I tranſcribe what *G. Robertſon* ſays of the *Dooger's Banks*, in the Memoir which he publiſhed in 1791, for the elucidation of his chart of the *China Sea*, page 34.

" The *Dooger's Banks* certainly exiſt, and are very dangerous: they are placed on the chart, " in their true ſituation, and from the following correſponding accounts: I took Mr. *D'Après'* " diſtance from *Pulo-Panjang* (folio, No. 49nd of the *Neptune Oriental*, 2nd edit.) allowing my " own longitude of that iſland, which places them in 0° 40′ north, and longitude 105° 26 eaſt: " (or 103° 5′ 45″ eaſt from *Paris*) to confirm which the *Ganges* ſaw the ſhoals: her latitude of " them is 0° 37′ north, 105° 29′ eaſt from *Greenwich*; ſo that I have little doubt of their being " nearly right."

I obſerve that *G. Robertſon* (page 34 of his Memoir) has placed, by a chronometer, the longitude of *Pulo-Panjang* from that which he has given to *Pulo-Aor*: and as the latter, according to my calculations, is more eaſterly by 2 minutes than that adopted by *Robertſon*, that of the *Dooger's Banks* muſt be likewiſe increaſed by 2 minutes. (*See* Note LX.)

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In deducing, by the dead reckoning, the ſituation of the ſhip from that of PULO-AOR, placed according to the obſervations made in COOK's voyage, it was found that, at noon, ſhe was 4′ north of the equinoctial line, and in 103° 12′ eaſt longitude.

At three o'clock in the afternoon, land was again diſcerned to the weſt half ſouth, and it was judged to be the ſame that had been ſeen in the morning. The winds were rather faint from the weſt-north-weſt and north-weſt, the weather overcaſt, and as Captain MARCHAND intended to paſs through the Strait of BANCA, he hauled the wind to make PULO-TAYA. But before ſix o'clock in the afternoon, land was ſeen ſtretching from ſouth to ſouth-ſouth-weſt. He immediately determined to anchor in order to wait for daylight, and he came to in nineteen fathoms, over a bottom of mud and ſand

The next day, at ſix o'clock in the morning, he diſcovered that the land ſeen to leeward was the northern coaſt of the Iſland of BANCA, which extended from ſouth a few degrees eaſt to ſouth-ſouth-weſt, diſtant ſeven leagues. He continued to perceive the ſame iſland which had been ſeen the day before, and it bore north-weſt 2° weſt; but near this iſland, and to the north-weſt by weſt, was ſeen another of a flat ſhape, and larger than the former; it was reckoned that the diſtance from the ſhip to theſe two iſlands might be five or ſix leagues.

According to theſe bearings, it could not be doubted that the currents had ſet at a very conſiderable rate to the *ſouth-eaſt:* and this effect does not agree with what is to be found in the ſailing directions of D'APRÈS, who ſays that, in this ſea, the currents ſet ſtrongly to the *ſouth-weſt.* It is clearly proved that the ſhip had been carried to the *ſouthward* and *eaſtward*; for the point of BANCA which bore ſouth a few degrees eaſt, was certainly Point PESANT, the

the moſt northern of the iſland, which there was ſoon an opportunity of verifying; and it is evident that the two iſlands which lay to windward, and which, the day before, had been taken for the ſmall iſland ſituated to the eaſtward of the eaſt point of LINGEN Iſland, becauſe, according to the dead reckoning, the ſhip was ſuppoſed to be much more to the northward than ſhe was in reality, it is evident, I ſay, that theſe were the RIGAUDIÈRE Iſlands. Captain CHANAL obſerves that, according to their ſituation on the chart of the *Neptune Orientale* (ſecond edition, No. 49, 2nd of the ſupplement), and according to that of the ſhip, PUL-TOTY, which, however, was not perceived, ought to have been ſeen at the ſame time: this might induce the ſuppoſition that the laſt-mentioned iſland is not rightly laid down on the chart with reſpect to the RIGAUDIÈRE Iſlands, and that it muſt be much nearer to them: it is even preſumable that, of the two iſlands which were in ſight, the one was PULO-TOTY, and the other, the higher of the RIGAUDIÈRE Iſlands, if, in fact, there be two of theſe; for, although D'APRÈS has laid down two iſlands on his chart, the denomination which he gives them of ILE RIGAUDIÈRE, would ſeem to indicate one iſland only: perhaps too the ſecond is but a little iſlot which cannot be perceived far off. Be this as it may, of the two iſlands which were perceived from the SOLIDE, at the ſame time that the northern coaſt of BANCA was in ſight, the one bore north by weſt, and the other, north-north-weſt half north from Point PESANT (TONG MACOODA,) at the diſtance of about thirteen leagues from this point*.

Captain

* The remarks made by Captain *Chanal*, who navigated by *D'Après'* chart, and could not be acquainted with that which *George Robertſon* did not publiſh till 1791, leads us to conceive that the French chart is defective in this part; and we are confirmed in this opinion if we caſt our eyes on the Engliſh chart, which is conſtructed from the various obſervations made on board the Eaſt India company's ſhips that trade to *China*. On this are ſeen two iſlands, the former, under the name of *Pulo-Toty* to the eaſt, the latter, to the weſt, under the name of *Docau*, both ſituated at the diſtance of fourteen leagues from the eaſtern extremity of Point *Peſant* of *Banca*. The bearings differ, as is ſeen, about a point from thoſe which were taken on board the *Solide*, and the diſtance

Captain MARCHAND weighed anchor at half paſt ſeven o'clock in the morning, and with a breeze from the north by weſt, he plied to windward, in hopes of reaching the northern entrance of the Strait of BANCA. During the forenoon, the ſoundings were from nineteen to eighteen fathoms over a bottom of ſand and ooze.

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diſtance is the ſame, within a mile: but Point *Peſant* is not a mathematical point; and, according to the part that was ſet of it, if it lie more to the eaſtward or more to the weſtward, the bearings of the iſlands which are determined from it muſt experience a change: the diſtance muſt be leſs affected by it; and, indeed, that which was eſtimated on board the *Solide*, and that given by *Robertſon*'s chart, differ from each other but a league. On *D'Après*' chart, *Pulo-Toty* ſtands alone, at fourteen leagues' diſtance, to the north by weſt of the eaſtern part of Point *Peſant*; and nothing there indicates the Iſland of *Docan*, which the Engliſh chart places three leagues to the weſt-ſouth-weſt of *Toty*; but to the north and the north by eaſt of the latter, at ſix or ſeven leagues' diſtance, *D'Après* places two other iſlands, *Rigaudière* and *Saint Pierre*, which are not to be found on *Robertſon*'s chart; and theſe two iſlands are placed, in regard to each other, on the French chart, at the bearings and at the diſtance which the Engliſh chart has given to *Toty* and *Docan*. We are fully juſtified in believing that, if we judge by the names given to the Iſlands *Rigaudière* and *Saint Pierre*, their poſition has been fixed according to the track of ſome French ſhip that had a miſtake in her reckoning. *Robertſon*'s chart appears to me to merit the preference to that of *D'Après*, becauſe it preſents two routes, indicated by two ſets of ſoundings, which paſs within two leagues of *Pulo-Toty*, and extend, the former to the north-north-weſt, rounding the eaſtern part of *Toty*, and the latter, to the north by weſt: from the former, *Toty* and *Docan* may both have been ſeen at the ſame time; and the track paſſes only within five leagues of Point *Peſant*.

In continuing to compare the two charts in this part, we remark that *Robertſon* places an iſland called *Porto-Bello*, twenty-two leagues to the eaſt half north of *Pulo-Toty*, and *D'Après* lays down none.

If we carry our eyes farther to the weſt-north-weſt of *Toty*, we ſee that, on the French chart, *Pulo-Taya* lies to the ſouth by weſt 3 or 4° weſt, and at the diſtance of ten leagues from *Lingen* Iſland; and that, on the Engliſh chart, the bearing is ſouth, and the diſtance eight leagues only. This latter chart preſents a track, which muſt have paſſed within ſight of theſe two points, and which, no doubt, has ſerved to fix their relative poſition.

As *Pulo-Toty* and *Pulo-Taya* are leading marks for ſhips which, in order to get out of the *China* Sea, ſtand either for the Strait of *Banca*, or for that between *Banca* and *Billiton*, I have thought that it would be uſeful to make known to French navigators who are not provided with *Robertſon*'s chart, the differences that are to be remarked between this chart, and that of *D'Après*, of which they make uſe: it will be for them to verify, when they may find an opportunity of ſo doing, which of the two charts, in this part, merits a preference.

From the obſervation of the ſun's meridian altitude, it was concluded that, at noon, the latitude of the ſhip was 1° 15′ ſouth; and her longitude, fixed according to the bearings of the land, was 103° 18′.

Had the ſhip's place been deduced from the dead reckoning brought forward from PULO-AOR, her latitude would have been only 0° 20′ ſouth, and longitude 102° 57′: in comparing this latter poſition of the ſhip with the former, it is ſeen that, in the interval of two days and a half, the currents had carried her near a degree to the ſouthward, and more than a third of a degree to the eaſtward.

As it was perceived, at half paſt three o'clock in the afternoon, that the currents were contrary to the route, Captain MARCHAND determined to come to an anchor at three leagues' diſtance from the northern coaſt of BANCA, in ſixteen fathoms water, over a bottom of ſand, gravel and ſhells. The latitude of the anchorage, deduced, by the dead reckoning, from that at noon, was 1° 23′ ſouth, and her longitude 103° 27′.

During the night, the wind blew freſh from the north-weſt to the north, accompanied with ſqualls. The velocity of the current was eſtimated at a mile an hour.

The part of Iſland of BANCA which our navigators had coaſted, is of a middling height: but, towards Point PESANT, the moſt northern point of it, are diſtinguiſhed ſome hillocks more elevated than the reſt of the ground.

On the 19th, Captain MARCHAND got under way in the courſe of the forenoon, but he was obliged to anchor a ſecond time; he made uſeleſs efforts to reach the entrance of the Strait of BANCA, and experienced rather

ſtrong currents, ſome of which ſet to the eaſt-north-eaſt, others to the eaſt, and others to the eaſt-ſouth-eaſt. He parted a cable in this ſecond anchorage, where the ſhip pitched very heavily, and he was obliged to leave the anchor behind.

Perſuaded that it would be in vain to perſiſt in ſtruggling againſt theſe obſtacles, he renounced the idea of going out of the China Sea by the Strait of Banca, and he determined to ſail out by another ſtrait ſituated more to the eaſtward, between the Iſland of Banca and that of Billiton.

This ſtrait, little frequented by the French, is known under the names of Gaspar's, Billiton's, or Clements' Strait. Captain Marchand was in poſſeſſion of no plan of this ſtrait but that which is to be found on the ſheet No. 48 of our *Neptune Oriental*, under the title of *Petit Plan du* Détroit a l'Est de Banca, *par lequel a paſſé un Vaiſſeau Eſpagnol, commandé par le Sieur* Gaspar (no date); but D'Après, in publiſhing this plan, appeared to doubt its correctneſs; and, in his ſailing directions, he gives notice that it would be imprudent to enter this ſtrait, till it is better known. Since the time of this publication, ſeveral French and Engliſh ſhips, inſtead of paſſing through the Strait of Banca, have taken their route, in order to get out of the China Sea, or to enter it, by the Strait Between Banca and Billiton. This ſtrait is divided into two arms by an iſland, to which its ſituation has occaſioned to be given the name of Middle Island: the West Passage is properly Gaspar's Strait; becauſe it is that by which the Spaniſh navigator, who has given us the firſt plan of it, had paſſed: the East Passage, which preſents ſeveral practicable channels between the ſmall iſlands, is called Clements' Strait, becauſe, in 1781, an Engliſh captain of that name, commanding a fleet of Indiamen, is the firſt known navigator who attempted to go out of the China Sea by this paſſage. A chart of the ſtrait Between Banca and

Billiton

BILLITON was conſtructed in 1784 and 1785, by DORDELIN, a lieutenant in the French navy, who paſſed through this ſtrait, both in going to CHINA and on his return. This manuſcript chart, which belongs to the *Dépôt Général des Cartes, Plans, et Journaux de la Marine,* was not publiſhed at the time, becauſe DORDELIN, too ſcrupulous, in regard to his own labours, and fearing to expoſe the ſafety of ſhips that might direct their courſe by his chart, judged that it ought not to be rendered public, till a farther verification had enabled him to improve it: this chart, although not perfect in all its parts, was far ſuperior to the defective plan of the Spaniſh navigator, on whoſe word DORDELIN had not been afraid to attempt the paſſage from the ſouthward, in a contrary direction to GASPAR, who had found it in coming from the northward. Since then, ALEXANDER DALRYMPLE, on the one hand, and GEORGE ROBERTSON, on the other, have publiſhed various plans and charts of this ſtrait, conſtructed at different times by Engliſh navigators; and DALRYMPLE has printed in his valuable Collection of nautical *Memoirs* reſpecting the *Seas of Aſia,* the journals of the captains of his nation to whom we are indebted for the plans and charts of which we are in poſſeſſion.

But theſe plans and charts are little known in FRANCE, and Captain MARCHAND, reduced, as I have ſaid, to the neceſſity of having recourſe to the ſhapeleſs plan of GASPAR, in order to direct his route in a ſtrait, againſt which the French navigators were likely to be prepoſſeſſed, heſitated not, however, to enter it, and ſeized with ardour the opportunity of juſtifying or deſtroying the uneaſineſs that D'APRÈS' failing directions muſt occaſion reſpecting the ſafety of a paſſage, which, in his time, was, as it were, only ſuſpected: ſucceſs has proved that this uneaſineſs was not well-founded.

As it is to be preſumed that the ſtrait BETWEEN BANCA AND BILLITON, at this day well known by the repeated trials of Engliſh and French navigators,

tors, will henceforth be preferred, on account of its advantages, and in all cases, to the long and dangerous Strait of BANCA, I have thought that it would be of some utility to the officers in our navy and merchant-service, to trace minutely the track which the SOLIDE followed in passing through GASPAR's Strait; to report the observations of latitude which were made in the passage, and to indicate the principal bearings that were taken from the places where, in order to stop tide, the ship was forced to come to an anchor. These details will be comprehended more easily, if the reader will follow them with the chart before him*.

On the 20th, at half past seven o'clock in the evening, the SOLIDE got under way from the second anchorage which she had been obliged to take up in sight of the northern coast of BANCA; and Captain MARCHAND could not but congratulate himself on having quitted it; for it was discovered, when the anchor was weighed, that the cable was stranded near the clinch; and it was judged that if the ship had remained longer exposed to the violence of the pitching which she had experienced during the night, the cable would inevitably have parted, and occasioned the loss of a second anchor.

On the 21st, at three quarters past six in the evening, Captain MARCHAND anchored to the north-west of the entrance of GASPAR's Strait, in fourteen fathoms, over a bottom of mud, gravel, and broken shells, after having passed between four breakers situated to the north-west and north by west of the east coast of the Island of BANCA; the farthest is fifteen leagues distant from this point, and the nearest, twelve. Point BRISÉE (TONG RYOTT) of the same island, situated between Point PESANT (TONG MACOODA) and the EAST Point, bore, from the anchorage, west-south-west, four or five leagues' distance.

* *See* the Charts, Nos. VII and VIII.

On

On the 22d, the ſhip was under ſail at fifty minutes paſt ſeven in the morning, and ſteered ſouth-ſouth-eaſt half eaſt; the ſoundings were conſtantly fourteen fathoms, with a bottom of ſand and gravel, mixed with broken ſhells.

At forty minutes paſt nine o'clock, a ſmall iſland, ſurrounded by breakers, and ſituated more to the offing than three others, lying all together on a line, to the eaſt and eaſt by ſouth of Point BRISÉE, bore weſt-ſouth-weſt.

From that moment, Captain MARCHAND ſteered ſouth-eaſt by ſouth; and the lead indicated from thirteen to fourteen fathoms, with the ſame kind of bottom as that which had been found in the morning.

At eleven o'clock, GASPAR Iſland, which is ſituated nearly under the ſame meridian as MIDDLE Iſland, and eight or nine leagues north of its north point, was perceived from the maſt-head: it bore eaſt 6° ſouth. A quarter of an hour after, the extremities of a remarkable mountain on the Iſland of BANCA, ſerving as a leading mark for its EAST point, which lies to the eaſt 9 or 10° north, and at about the diſtance of ſeven leagues from this mountain, bore from ſouth 13° weſt to ſouth 42° weſt.

At noon, the EAST point of BANCA bore ſouth 43° eaſt, and the middle of GASPAR Iſland, directly eaſt: in this ſituation, the latitude obſerved was 2° 21′; and, allowing for the action of the currents, it was eſtimated that the longitude of the ſhip might be 104° 12′; which would carry that of GASPAR Iſland, the diſtance from which was reckoned twenty-eight or twenty-nine miles, to 104° 40′.

Captain MARCHAND ſteered eaſt-ſouth-eaſt half eaſt: the lead continued

to indicate twelve, fourteen, and ſixteen fathoms water, till one o'clock in the afternoon when it ſhewed twenty fathoms, over a bottom of ſand and gravel: he began to perceive the firſt of the iſlots of ROCHER-NAVIRE (TREE ISLAND) ſituated between the EAST point of BANCA and GASPAR Iſland.

At three quarters paſt two, another of the iſlots of TREE-ISLAND, the ſouthern iſlot, bore, one line with the ſouth point of GASPAR Iſland eaſt 23° north: a chain of rocks was diſcovered between this ſecond iſlot and the firſt. At the ſame time, a ſmall iſlot was diſcovered to the ſouthward of the EAST point of BANCA.

Captain MARCHAND ſteered ſouth-eaſt half ſouth till three o'clock: from half paſt one, he had carried with him twenty and twenty-one fathoms water, with the ſame kind of bottom as in the preceding ſoundings.

At three o'clock, the EAST point of BANCA bore ſouth 53° weſt; GASPAR Iſland, north 53° eaſt; and the firſt-mentioned iſlot between that iſland and the EAST point of the great iſland, north 39° eaſt.

He then ſteered ſouth by eaſt, in order to get up with the peninſula of SEL *, which, with the ſouth-weſt point of MIDDLE Iſland, forms the narroweſt part of the WEST PASSAGE. Till four o'clock, the ſoundings were ſtill twenty-two, twenty-three, and twenty-four fathoms. He then diſ-

* Several charts or plans have deſignated as an iſland the land which, on GASPAR's Plan, bears the denomination of the *Ile de Sel:* it is at this day admitted that it is only a peninſula, connected with the Iſland of *Banca* by a ſlip of land ſo low as not to be always perceived from the diſtance at which the reef, that terminates this land to the eaſtward, requires that ſhips ſhould keep from it.

covered

covered the peninſula of SEL, and the iſlands which are ſituated in the eaſt part of the ſtrait. The EAST point of BANCA bore north 71° weſt; the NORTH-EAST extremity of the peninſula of SEL, ſouth 32° weſt.

It was perceived that the currents carried the ſhip to the eaſtward of her courſe; and, in order to counterbalance their effect, and draw more in with the peninſula of SEL, by entering the paſſage, Captain MARCHAND ſteered ſouth by weſt. At a quarter paſt four, the lead announced that the water was ſhoaling; there were no more than eighteen and ſeventeen fathoms; but it kept at this depth, and the bottom was conſtantly gravel and ſhells.

As the currents ſet rapidly to the ſouth-ſouth-eaſt, at five o'clock, Captain MARCHAND ſteered ſouth-ſouth-weſt half ſouth: the ſoundings were ſeventeen fathoms, with the ſame kind of bottom, till ſix o'clock, when the EAST point of BANCA bore north 23° 30′ weſt; GASPAR Iſland, north 17° eaſt; the moſt eaſtern of the ſmall iſlands ſituated to the northward of the peninſula of SEL, ſouth 81° weſt; the NORH-EAST point of the peninſula, ſouth 77° 30′ weſt, and its SOUTH-EAST point, ſouth 15° weſt.

The SOLIDE was then beginning to enter the paſſage between MIDDLE Iſland and the peninſula of SEL: Captain MARCHAND ſteered ſouth half eaſt, under eaſy ſail, till forty minutes after ſix, when he came to an anchor in ſeventeen fathoms water, over a bottom of ſand and fine gravel, mixed with broken ſhells.

During the night, the wind varied from north-weſt to weſt-north-weſt, the currents ſet to the ſouth-ſouth-eaſt, and then to the ſouth, at the rate of a mile and a half or two miles an hour.

From

From the anchorage, the hummock on the EAST point of BANCA bore north 21° weſt; GASPAR Iſland, north 13° 30′ eaſt; the peninſula of SEL, from ſouth 22° weſt to weſt 1° ſouth; the ſouth-weſt extremity of MIDDLE Iſland ſouth 84° eaſt; and four ſmall iſlands which were perceived to the ſouth-eaſt and ſouth-ſouth-eaſt of this laſt-mentioned iſland, from ſouth 76° eaſt to ſouth 56° eaſt.

The SOLIDE was under ſail at three-quarters paſt ſix in the morning, and ſteered ſouth half eaſt; but, a little time after, ſhe bore up ſouth-eaſt by ſouth, and then directed her courſe ſouth-ſouth-eaſt half-ſouth. On the eaſt coaſt of the peninſula of SEL, were diſtinguiſhed ſome breakers which appear to run a mile into the offing, and to extend as far as the ſouth point of this peninſula. The depth of water kept increaſing from ſeventeen to twenty fathoms, with a bottom of ſand and gravel.

At twenty-two minutes paſt ſeven, all the lands in ſight were ſet by the compaſs, in order that their bearings might be laid down on the plan. The SOUTH-EAST extremity of the peninſula of SEL then bore ſouth 54° weſt. Captain MARCHAND ſteered ſouth, and the ſoundings increaſed from twenty to twenty-four fathoms, with the ſame kind of bottom. He perceived more and more the ſouth part of the Iſland of BANCA, and was on the point of being clear of the Strait. He croſſed ſome ſtrong ripplings of currents, which, at a diſtance, might have been taken for chains of breakers.

At twenty minutes paſt eight, MIDDLE Iſland bore from north 11° 30′ eaſt to north 32° eaſt; and the middle of the moſt eaſtern of the iſlands ſituated to the northward of the peninſula of SEL, in one with the NORTH-EAST point of the latter, bore north 34° 30′ weſt.

From this point, Captain MARCHAND ſteered ſouth half weſt: the water gradually ſhoaled from twenty-four to twenty fathoms, with the ſame kind of bottom.

At ſeven minutes paſt nine o'clock, the iſlots, ſeven in number, which lie to the ſouth-eaſt and ſouth-eaſt by eaſt of MIDDLE Iſland, were partly ſhut in, the one by the other, in the direction of north 43° eaſt; and the SOUTH-EAST point of the peninſula of SEL bore north 53° 30′ weſt.

Till three quarters paſt nine, Captain MARCHAND ſteered ſouth-ſouth-weſt half ſouth, and the ſoundings were regular from twenty to ſeventeen fathoms. At this period, the extremities of the eaſtern coaſt of the peninſula of SEL bore from north 13° 30′ weſt to north 44° 30′ weſt.

The SOLIDE was then clear of the ſtrait, and Captain MARCHAND hauled his wind, at the ſame time carrying a preſs of ſail on the ſtarboard tack.

At half paſt ten o'clock, the ſhip fell all at once from ſeventeen fathoms into nine, with a bottom of ſand and gravel: this ſudden diminution of the depth of water obliged Captain MARCHAND to navigate with precaution: he conſtantly kept the lead going; it indicated the ſame ſoundings, varying only from eight fathoms to nine, till half paſt eleven o'clock, and from ten fathoms to eleven, till noon.

At this laſt-mentioned period, no other lands were perceived than thoſe to the ſouthward of the Iſland of BANCA, which extended from north-weſt half weſt to north north-weſt half north. The obſervation of the ſun's meridian altitude gave 3° 30′ ſouth latitude; and, in allowing for the effect

of the currents, which, according to the result of the dead reckoning compared with that of the observation, had carried the ship 25 minutes to the southward, in twenty-four hours, and which was also reckoned to have carried her 11 minutes to the eastward, it was concluded that the longitude must be 104° 28′.

The detail of Captain MARCHAND's navigation in GASPAR's Strait, such as I have just represented it, as it were, hour by hour, would be a sufficient guide, by which navigators who should wish to get out of the CHINA Sea by this passage, might direct their course with safety; but, in order to render more useful the remarks that were made on board the SOLIDE, Captain CHANAL, associating his nautical knowledge with the talents and zeal of the Engineer LE BRUN, who had embarked in the ship, for the purpose of going from MACAO to the Isle of FRANCE, carefully constructed a plan of GASPAR's Strait; he subjected it, on the one hand, to the latitude that was observed on the 22d in the parallel of GASPAR Island, the principal leading mark of the two passages for ships coming from the northward, and that which was observed on the 23d on coming out of the Strait, the ship being clear of all land; and on the other hand, to numerous bearings that were taken in the different situations, under sail or at anchor: he has accurately laid down on the plan all the soundings that were taken, from the most northern point of the Island of BANCA to the parallel of its south coast; and each sounding has been placed at the point of that track which the bearings have determined*.

* I have conceived that it was useless to transcribe all the bearings which were taken on board the *Solide*, from the time that she was within sight of the north point of *Banca* till after she came out of the Strait; I have laid down those only which appeared to me useful for fixing the relative positions of the principal points.

Captain

Captain CHANAL was not able to extend his work beyond GASPAR's paſſage; and, in order to complete his chart, he copied from that of D'APRÈS the EAST paſſage between MIDDLE Iſland and the Iſland of BILLITON; but he took care to give notice that he was very far from vouching for the correctneſs of this borrowed part; and this notice was the better timed, as the eaſtern part of the chart publiſhed by D'APRÈS as unwarranted, is defective in every point, and as the weſt part is ſcarcely more correct: moſt aſſuredly there would be leſs danger for a ſhip to attempt the paſſage from the mere inſpection of the land, and with the precautions that are employed in a voyage of diſcovery, than to truſt to a plan ſuch as that of GASPAR, which could only lead the navigator into error.

I have been of opinion that the chart which was conſtructed on board of the SOLIDE would become ſtill more uſeful, if, in order to complete it, uſe were made of the work of the Engliſh, who have given us ſeveral tracks in the Weſt Paſſage, and others in the Eaſt Paſſage, marked on authentic plans, ſome of which have been publiſhed by ALEXANDER DALRYMPLE in his valuable collection, and others by GEORGE ROBERTSON. I have combined together ſix different plans, two of which belong to the French, and four to the Engliſh; and I think I may venture to affirm, that the General Chart which I preſent muſt have all the correctneſs that can reſult from the information which we have, till this day, acquired reſpecting the two paſſages or ſtraits that preſent themſelves to ſhips of all rates between the Iſland of BANCA and that of BILLITON: I refer the reader to the *NOTES* for the examination and analyſis of the materials which I have employed in the conſtruction of this new chart*. It was not without concern

* *See* Note LXII. This note contains not a mere geographical analyſis and the diſcuſſion of the materials which have been employed in the conſtruction of the *General Chart of the Strait between*

concern that I found myſelf under the neceſſity of criticiſing ſome of the plans which the Engliſh have given us; but, in not always adopting their opinions and their plans, we cannot, while we are combating them, avoid acknowledging that their bold voyages into every ſea, and their numerous labours concerning every coaſt, have long ſince acquired them inconteſtable claims on the gratitude of all navigators: and if criticiſm be ſevere when the queſtion is to examine their productions, it is becauſe it may be feared that their weighty authority will too eaſily accredit errors.

I have already ſaid that D'APRÈS, in publiſhing the Plan of GASPAR's Paſſage, ſuch as it had been communicated to him, judged that it was prudent to diſſuade navigators from entangling themſelves between the Iſlands of BANCA and BILLITON; and he thought it incumbent on him to adviſe them to continue to take their route through the Strait of BANCA; but the experiment of the SOLIDE, and previouſly that of the TRITON, the PROVENCE, and the SAGITTAIRE under the command of DORDELIN, that of the

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between Banca and Billiton, comprehending *Gaſpar's* and *Clements'* Straits, with the different paſſages which both preſent; it likewiſe contains a minute deſcription of the two ſtraits, as well as ſailing directions for the navigation of the two paſſages. I have laid under contribution the journals of ſeveral Engliſh navigators, which have not been tranſlated into our language, and with whoſe names even our navigators were not acquainted: their obſervations are valuable, and deſerved to be collected; to theſe I have added thoſe of our Captains *Dordelin* and *Chanal*, and I have formed of the whole a regular work, the ground of which does not belong to me, and of which I have only arranged the parts, in order to connect them together by comparing the reports of the different navigators, ſtrengthening them the one by the other when they agree, and oppoſing them to each other when they are at variance. This work may, with French ſeamen, ſupply the place of a great number of foreign journals which would afford them, beſides, only uſeleſs repetitions. I ſhall have accompliſhed my object, if, in preſenting to them the Straits *Between Banca and Billiton* as preferable to the Strait of *Banca* as well for ſhips returning from *China* as for thoſe going thither, I have furniſhed them with the information neceſſary for navigating there with ſafety, by directing their courſe according to the tracks of the experienced navigators who have opened the way.

Engliſh

Engliſh ſhips, the MACCLESFIELD, the SULIVAN, the HAWKE, the PONSBORNE, the WARREN HASTINGS, the CARNATIC, the VANSITTART, the GLATTON, and her fleet under the orders of JOHN CLEMENTS, &c. muſt diſpel for ever the fears that were maintained, and with reaſon, by the impoſing authority of a learned navigator, who, from a long acquaintance with the ſeas of ASIA, and great labours, executed with ſucceſs, for improving the hydrography and facilitating the navigation of them, had acquired the right of ſpeaking as a maſter, and of cauſing himſelf to be heard with attention. No doubt, his opinion would have changed, and he would have been eager to amend his deciſion, had he been acquainted with tracks which have been followed only ſubſequently to his work and his death: he would have judged that a paſſage on a ſtraight line and very ſhort, like that of GASPAR, in which, throughout, if the wind be not favourable to the courſe, or if it be wiſhed to paſs the night at anchor, a ſhip may come to in a good depth of water, and on a good bottom, deſerves every preference to a long and winding paſſage, ſuch as that of BANCA, the entrance of which, in coming from CHINA, it is difficult to reach with the winds neceſſary for engaging in it; in which the different directions of the lands require different winds for paſſing from one branch to another; and which preſents, on leaving it, ſhoals and over-falls that obſtruct navigation and multiply its dangers.

CLEMENTS' Paſſage, the moſt eaſtern of the two ſtraits that are compriſed between the Iſlands of BANCA and BILLITON, affords, in many reſpects, the ſame advantages as that of GASPAR, through which Captain MARCHAND paſſed; but ſhips coming from the weſtward, will prefer the latter of the two ſtraits; and thoſe coming from the eaſtward will alſo prefer it, if the wind allow of their ſo doing; for CLEMENTS' Strait, in the narroweſt part, is ſtrewn with iſlots, banks, and ſhoals, which, indeed, are moſtly viſible, and

and near which is found a good bottom fit for anchoring, but which, however, may occaſion ſome uneaſineſs and embarraſſment in a confined paſſage, where the action of the currents is commonly very violent, and where navigators muſt experience ſudden variations in their direction, in proportion as they preſent themſelves at the opening of the numerous channels which the banks and iſlots form between them, and according to the time and the ſetting of the tides. But CLEMENTS' Paſſage, obſtructed as it is, appears to be frequented by the Engliſh; and this is a ſtrong reaſon for believing that its navigation is not dangerous, ſince they have the choice between the two paſſages. I am perſuaded, however, that a navigator who neither has uſed the one nor the other, will, on an inſpection of the chart, give the preference to GASPAR's Paſſage: but, unqueſtionably, he will prefer either to the Strait of BANCA, if, in coming from CHINA, he wiſh to arrive more expeditiouſly and more ſafely in the Strait of SUNDA; or if, coming from EUROPE, and after having paſſed this laſt-mentioned ſtrait, he wiſh to proceed with greater diſpatch to the coaſt of CHINA whither his trade calls him.

On the afternoon of the 23d, Captain MARCHAND, after having doubled to the ſouthward all the lands which form GASPAR's and CLEMENTS' Straits, and wiſhing to make the Iſland of SUMATRA, off the ſmall iſlands called the Two BROTHERS, directed his courſe towards the Strait of SUNDA, ſtanding on cloſe to the wind which blew from the north-weſt quarter. During the whole day, the ſoundings were conſtantly ten fathoms, at firſt a bottom of fine gray ſand, then oozy ſand; and they afterwards increaſed to twelve fathoms. He anchored ſeveral times in this run, when, a calm coming on, he was apprehenſive that the currents might drive the ſhip out of her courſe.

On the 25th, at half paſt twelve o'clock at noon, he got ſight of the coaſt of SUMATRA, at the diſtance of ſix or ſeven leagues. The latitude obſerved at noon, had been 4° 25′ ſouth; and in comparing it with that by the dead reckoning, it was diſcovered, that, ſince noon of the preceding day, the currents had carried the ſhip 17 minutes or near ſix leagues to the ſouthward. It was reckoned that the longitude deduced from that of Point PESANT on the north ſide of BANCA, was, at the moment when SUMATRA was perceived, 103° 44′, and the latitude, 4° 26′; the ſhip was then in twelve fathoms water.

Captain MARCHAND paſſed the night at anchor, and weighed at half paſt ſix o'clock the next morning. Half an hour after he had got under ſail again, he diſcerned the iſlands called LES DEUX SŒURS *, which he had intended to make; and they bore ſouth-weſt at the diſtance of two or three leagues.

He concluded from the latitude of 5° 4′ obſerved at noon, and from the bearing that was taken at the ſame moment, that LES SŒURS, the moſt ſouthern of which bore ſouth-weſt, diſtant one league, are ſituated in latitude 5° 6′: the longitude of the ſhip was then 103° 36′. The middle of theſe two iſlands is placed on the chart, No. 47, of D'APRÈS' *Neptune Oriental*, in latitude 5°; and their diſtance from the coaſt of SUMATRA, which is ſeven leagues on this chart, appears to be too conſiderable; it is reckoned that it might be reduced to five.

From within ſight of LES DEUX SŒURS till he made Point ST. NICHOLAS in the Iſland of JAVA, at the entrance of the Strait of SUNDA, calms and contrary winds obliged Captain MARCHAND to anchor repeatedly: it was

* Theſe are the ſame iſlands that are named on the Engliſh charts the TWO BROTHERS.

not

not till the 31ſt, in the afternoon, that he reached the entrance of the ſtrait; but the wind not permitting him to weather the rock ſituated in the middle of the paſſage between MIDDLE Iſland and TOCA or HOG's Point in the Iſland of SUMATRA, he came to an anchor off PULO REMOW, or LONG Iſland, three-quarters of a mile from the land, in thirty fathoms water, over a bottom of gravel and ſhells. In this ſituation, MIDDLE Iſland bore from ſouth-eaſt to ſouth-ſouth-eaſt 4° ſouth; the peak of CRACATOA Iſland, ſouth-weſt half weſt; the GRAND TOQUE, eaſt-ſouth-eaſt; and the rock in the MIDDLE of the paſſage, ſouth half weſt.

On the 1ſt of January 1792, at half paſt ſeven o'clock in the morning, the ſhip ſet ſail for the Iſle of FRANCE.

For a few days the contrariety of the winds allowed not of her increaſing her diſtance from the vicinity of the ſtrait; at length, on the afternoon of the 4th, Captain MARCHAND took his departure from PRINCE's Iſland, ſituated to the northward of the weſt point of JAVA, at the mouth of the ſtrait, and, according to aſtronomical obſervations, in 6° 36′ 15″ ſouth latitude, and 102° 55′ eaſt longitude*.

On the 11th, at half paſt four o'clock in the afternoon, the latitude of the ſhip deduced by the dead reckoning from that which had been given by the obſervation of this ſame day at noon, was 11° 37′ 10″; and her longitude deduced, by account, from that of PRINCE's Iſland, 95° 14′ 15″.

At that moment, a low land was perceived to the ſouth-ſouth-eaſt, at the diſtance of ſix leagues.

* *Connoiſſance des Temps* (Ephemeris.) An VIII. de l'Ere Françaiſe (1800.)

From

From this bearing, the land in ſight muſt have been ſituated in latitude 11° 54′, and longitude 95° 21′ 15″: it was judged that it could be no other than the largeſt of the Iſlands of Cocos, that group of ſmall iſlands thrown at about the diſtance of a hundred and ſixty-five leagues to the ſouth-weſt of FLAT Point, the moſt ſouthern of the Iſland of SUMATRA; but, at the ſame time, it was concluded that there was an error in the diſtance eſtimated by the eye, from the ſhip to theſe iſlands*, and an error in the dead reckoning ſince ſhe had quitted PRINCE's Iſland; for, according to aſtronomical obſervations, the large Iſland of Cocos is ſituated in latitude 12° 11′, and longitude 94° 3′†.

The

* It might alſo be ſuppoſed that there was an error in the latitude obſerved on board the ſhip; but it is more probable that the diſtance from the ſhip to theſe iſlands had been incorrectly eſtimated by the eye, an error which is very common.

† This is the longitude which is to be found in the *Connoiſſance des Temps* of the year VIII. of the French era (1800) and the preceding years: it is there indicated as deduced from lunar obſervations made at ſea; and is preſented as the ſituation of the *middle of the largeſt of the iſlands.*

G. Robertſon gives us, reſpecting theſe Iſlands of *Cocos*, a detail which deſerves to be mentioned: it is engraved in Engliſh at the bottom of his Chart of the *China Sea.*

Memorandum for ſhips leaving Java Head (the moſt weſtern part of the Iſland of Java) *for Europe.*

" The true ſituation of the *Kelling* or *Cocos* Iſlands, determined by an exact *Arnold*'s box-
" chronometer, in a ſhort run from *Java Head*, and corroborated by three ſets of lunar obſerva-
" tions, objects eaſt and weſt.

" The northernmoſt is a ſingle low iſland, in latitude 11° 50′ ſouth, longitude 8° 1′ weſt of *Java Head*, or 97° 8′ eaſt from *Greenwich* (94° 47′ 45″ eaſt from *Paris*); and it lies due north
" from the moſt weſtern of the cluſter of iſlands, diſtant 14 miles. Between them is a fair paſſage,
" which in the *General Coote*, Captain *Baldwin*, we paſſed through.

" The ſouthernmoſt are a circular cluſter of low iſlands, whoſe latitude is from 12° 4′ to 12° 23′
" ſouth. Their eaſtern extreme 7° 50′ weſt of *Java Head*, 97° 19′ eaſt from *Greenwich* (94° 58′ 45″
" eaſt from *Greenwich*); and their weſtern extreme under the meridian of the moſt northern
" iſland," that is to ſay, 97° 8′ from *Greenwich* (94° 47′ 45″ from *Paris.*)

" In ranging along the north part of the cluſter of iſlands, ſaw no danger detached from them,
" being ſteep-to cloſe into the ſhore, which is a beautiful white beach appearing like ſand, but
" which I believe is white coral.

" A reef runs out from the north-weſt corner of theſe iſlands a ſhort quarter of a mile, and they
" may be ſeen in clear weather, from an Indiaman's deck, five leagues."

Signed, *G. R. (George Robertſon.)*

The error of nearly 17 minutes in the latitude which the bearing, deduced from the latitude of the ſhip, gave to the Iſland of Cocos, proves that the diſtance eſtimated from the veſſel to that iſland was not ſufficiently great; and the difference of 1° 18′ 15″ in the longitude, proved that, from PRINCE's Iſland, whoſe longitude is likewiſe determined by obſervation, the calculation of the run made by the ſhip, in the ſpace of ſeven days, was in error all this quantity, which ſhe had been carried to the weſtward by the movement of the waters, without the ordinary methods of navigation having been able to furniſh any means of eſtimating its effect.

From the Iſland of Cocos, the SOLIDE directed her courſe weſt-ſouth-weſt, in order to get into the parallel of RODRIGUE Iſland, from which Captain MARCHAND wiſhed to take a freſh departure before he ſtood for the Iſle of FRANCE.

On the 16th, a little before nine o'clock in the morning, in the latitude of 15° 47′ 15″ ſouth, the mean between the reſults of ſeveral obſervations of diſtances of the ſun and moon, gave for the longitude of the ſhip 85° 15′; that which was deduced, at the ſame inſtant, from the dead reckoning ſince the departure from PRINCE's Iſland, was 86° 45′: thus, in the ſpace of twelve days, the ſum of the errors of the reckoning was a degree and a half, which the ſhip had advanced more to the weſtward than was ſuppoſed. And as, when ſhe was in ſight of the Iſland of Cocos, on the 11th, the error in the

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Robertſon, in his Table of Poſitions (page 79 of his Memoir) gives the longitude of *Java Head* 105° 9′ eaſt of *Greenwich*; it is only 105° 5′ according to the obſervations made in *Cook*'s Third Voyage (page 351 of the *Original Aſtronomical Obſervations*, &c.): and if we adopt this latter determination, the longitudes of the *Cocos* Iſlands muſt be diminiſhed by 4 minutes.

N. B. There is an error of the preſs in the Collection of Obſervations, which I have juſt quoted. We there read, *Java the moſt* eaſterly *Point of the Straits* of Sunda; read *the moſt* weſterly *Point*, &c.

ſame

ſame direction was only 1° 18′, it might thence be inferred that, from the 11th to the 16th, the error had increaſed 12 minutes; but this inference would imply, that we grant to the reſult of the lunar obſervations ſo great a degree of accuracy that they may be employed with ſafety in correcting ſmall errors. What we may ſolely conclude, is that, from the 4th, when the ſhip took her departure from PRINCE's Iſland, to the 16th, the day of the laſt lunar obſervations, ſhe was conſtantly carried to the weſtward by the effect of the currents; and that the quantity of this unperceived progreſs was about a degree and a half in the interval of twelve days, or about eight miles in twenty-four hours.

On the 19th, at eight o'clock in the morning, in 18° 37′ 20″ latitude ſouth, the mean reſult of four ſets of lunar obſervations fixed the longitude of the ſhip at 77° 59′; that which was indicated by the dead reckoning, brought forward from the obſervation of the 16th, was 78° 17′: thus the error in the interval had been 18 minutes, or ſix miles in twenty-four hours, in the ſame direction as the preceding ones.

Other lunar obſervations, made on the 27th, at eleven o'clock in the morning, in latitude 19° 40′, gave 62° 29′ for the longitude; that which was deduced from the dead reckoning, brought forward from the obſervation of the 19th, was 63° 21′: the error of the reckoning had therefore been, in the ſpace of eight days, 52 minutes, or ſix miles and a half in twenty-four hours, and ſtill in the ſame direction, the currents had conſtantly ſet the ſhip to the weſtward, or *ahead* of the reckoning.

From the reſult of the obſervations of that day, Captain MARCHAND reckoned, at ſix o'clock in the evening, that he could not be more than ſeventeen or eighteen leagues from RODRIGUE Iſland, when it was perceived

as far as it could be ſeen, that is, at the diſtance of thirteen or fourteen leagues: thus the error of the ſhip's ſituation by account, with reſpect to her true ſituation, was not more than three or four leagues in a run of upwards of eight hundred; but it would have been about fifty-ſeven leagues *aſtern*, that is to ſay, he would have met with RODRIGUE Iſland fifty-ſeven leagues ſooner than was expected, had he employed, for regulating his courſe, only the arbitrary and uncertain methods of the dead reckoning: for, in recapitulating the partial differences, ariſing, at various periods, between the reſults of the dead reckoning and thoſe of the obſervations, we find that the ſhip had been carried 2° 40′, or about one hundred and fifty miles *ahead* of the account, and one hundred and ſixty in adding thereto the ſmall error diſcovered on making the land.

Hence it therefore reſults, that the unperceived progreſs of the ſhip to the weſtward, had been (on an average) $7\frac{1}{3}$ miles in twenty-four hours. This may be attributed to the effect of the currents, which may have had a conſtant direction; but might it not alſo be conſidered as the effect of a general movement of the waters from eaſt to weſt, which is moſt commonly eſtimated, in an open ſea, between the tropics, at the rate of eight or nine miles for each diurnal revolution of the earth?

I have thought it incumbent on me not to throw into the *NOTES* the reſult of the obſervations which were made in the run from MACAO to PRINCE's Iſland (Strait of SUNDA), and from the Strait to RODRIGUE Iſland: it is well known that the currents have a conſiderable influence in the Indian Seas: their direction, which varies according to the ſeaſons, ſometimes in the ſame ſeaſon, requires all the attention of the navigator, becauſe their action has a material effect on the ſhip's courſe, and may give riſe to fatal errors. In preſenting to ſeamen theſe runs with minuteneſs, I wiſhed to enable them to appreciate the

utility

utility of the lunar obſervations for the ſafety of navigation and the improvement of hydrography; the example here ſtands by the ſide of the precept; and if they perſiſt in rejecting evidence, if they repel light, I ſhall not at leaſt have to reproach myſelf with not having made it ſhine to their eyes.

Captain MARCHAND, after having made RODRIGUE Iſland, directed his courſe towards the Iſle of FRANCE; and, on the 30th of January, the SOLIDE anchored in the principal port in the iſland ſituated on the NORTH-WEST coaſt.

The run from PRINCE's Iſland had laſted twenty-ſix days, and the mean progreſs of the ſhip had been thirty-five leagues one-third in twenty-four hours.

The ſhip had kept the ſea for thirteen months and a half; and, with the exception of thirty days ſpent at anchor at LA PRAYA, LA MADRE DE DIOS, TCHINKITANAY, and MACAO, ſhe had been conſtantly under ſail. The health of the crew did not appear to be impaired by the fatigues of this long voyage; but, in order to return to the port in EUROPE from which the ſhip had been diſpatched, there remained three or four thouſand leagues for her to run, which might occupy four months: the relaxation neceſſary for preventing diſorders, the repairs to be made to the ſhip, the examination and the renewal of the proviſions, the purchaſe, the taking on board, and the ſtowage of merchandiſe; in ſhort, all the preparatives of a long voyage required that Captain MARCHAND ſhould ſpend two months and a half at the Iſle of FRANCE.

CHAPTER

CHAPTER IX.

Departure from the Isle of France.—*The* Solide *touches at the Isle of* Bourbon, *now called the Isle of* Réunion, *in order to load there with coffee.—Run from that island to* St. Helena.—*Stay at this latter island.—Directions for anchoring in its road.—Various considerations respecting St. Helena.—Advantages of its situation, and of that of Gibraltar, to the nation which occupies those two rocks.—Navigation from* St. Helena *to the Strait of* Gibraltar.—*The* Solide *returns to* Toulon.—*On the length of voyages round the World, and the means which might shorten it.—Praises due to the owners of the ship, to the Captain, and to the officers.—Utility of the new methods for determining at sea the position of the ship.*

It was on the 18th of April that the Solide got under way from Port Nord-ouest in the Isle of France, in order to return to Europe, calling at the Isle of Bourbon, now denominated the Isle of Réunion, where she was to take in a cargo of coffee.

On the 20th, Captain Marchand came to at the anchorage of St. Denis; and, on the evening of the 21st, he again got under sail, and directed his course to make the coast of Africa, and double the Cape of Good Hope.

This run, like that which preceded it, presents, concerning the effect of the currents and the errors of the reckoning, several observations, which, notwithstanding the little interest that details of this sort can afford to the generality of readers, have appeared to me to deserve, for the instruction of seamen and the improvement of navigation, to be mentioned at some length, reserving to myself to extend, in the *Notes*, such of these observations as may appear necessary.

On

On the 28th, the longitude of the ſhip deduced from lunar obſervations, and reduced to noon, was, by a mean between four ſets, 42° 44′: that which was given by the dead reckoning, deduced from the Iſle of Réunion, whoſe geographical poſition is determined by aſtronomical obſervations *, was 44° 51′: thus, in the ſpace of ſeven days, the ſhip had been carried to the weſtward, or *ahead* of her apparent run, 2° 7′, or thirty-eight leagues and a half †.

The daily errors in the direction of the latitude, aſcertained by obſervation, were no leſs remarkable: from the 24th to the 25th, the ſhip had been carried 34 minutes, or eleven leagues and two thirds, to the ſouthward; and during the laſt two days, ſhe had been carried 9 and 12 minutes to the northward.

The obſervations of the next day, the 29th, in like manner reduced to noon, ſhewed that, in the laſt twenty-four hours, the apparent progreſs of the ſhip towards the weſt, had been again increaſed by the effect of the currents, 24 minutes or about ſix leagues; and the obſervation of latitude indicated that ſhe had been carried to the northward 7 minutes, or two leagues one-third ‡.

She was again carried 13 minutes towards the north, from the 29th to the 30th; 3 minutes in the ſame direction from the 30th of April to the 1ſt of May; and 11 minutes from the 1ſt to the 2d; but from the 2d to the 3d, ſhe was carried 33 minutes or eleven leagues to the ſouthward.

For ſome days, the weather did not allow of obſervations being made for the longitude; and on the 8th of May, at three o'clock in the afternoon, our

* Longitude of *St. Denis* 53° 10′ 0″ eaſt. *Connoiſſance des Temps. an* VIII.
† *See* Note LXIII. ‡ *See* Note LXIV.

navigators

navigators had the firſt ſight of the coaſt of AFRICA in the vicinity of the Land of NATAL off LAGOA Bay: they could not have expected to ſee it ſo ſoon.

The bearings of the land, whoſe poſition in longitude, ſubjected to that of the Cape of GOOD HOPE, cannot be defective, ſhewed, on the 9th, at noon, that, ſince the obſervations of the 29th, in the ſpace of ten days, the ſhip had again been carried 1 degree to the weſtward, *ahead* of her apparent progreſs towards this coaſt *.

Thus then, in the ſpace of nineteen days, from the time of the SOLIDE's departure being taken from the Iſle of RÉUNION to that of her making the land on the coaſt of AFRICA, there is a ſum of errors in longitude, of more than three degrees and a half, or upwards of ſixty leagues, which Captain MARCHAND would have reckoned himſelf diſtant from the coaſt when he got ſight of it, if the obſervations made ſince the departure had not corrected this error by 2° 30′, and reduced it to that of 1 degree, which had taken place in the interval between the laſt day of obſervation, and that of making the land.

The errors in the latitude were conſiderable during the latter days: from the 2d to the 3d, 33 minutes or thirty-three miles; from the 4th to the 5th, ſixteen; from the 5th to the 6th, three; from the 6th to the 7th, four; from the 7th to the 9th, forty. The ſum of theſe errors, in ſeven days, is 1° 40′, or one hundred miles, which the ſhip had been carried to the ſouthward beyond the quantity indicated by the dead reckoning; this is at the rate of fourteen miles two-thirds in twenty-four hours: but the differences towards

* *See* Note LXV.

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that ſide cannot be a matter of aſtoniſhment. The ſhip had ſailed, in that ſpace of time, at the opening of the MOZAMBIQUE Strait; and the direction of this ſtrait, which is nearly north-north-eaſt and ſouth-ſouth-weſt, muſt determine that of a ſtrong current the effect of which is felt at a diſtance, and carries veſſels to the ſouthward, declining towards the weſt, according to the direction of the ſtrait.

On the 9th, at noon, the latitude obſerved was 33° 33′; and, according to the bearing of the land, the longitude muſt have been 25° 57′.

At two o'clock, the change of the water announced that ground would be reached in ſounding: at a quarter paſt three, ſoundings were ſtruck in ſeventy-five fathoms, over a bottom of gravel and rotten ſhells.

The coaſt, at that moment, extended from north-eaſt by north 2° north to weſt 4° north; and the ſhip's diſtance from it might be five leagues.

A dreadful ſtorm came on in the night of the 9th, and laſted till the morning of the 12th. The violence of the wind, which varied from weſt-north-weſt to weſt, joined to the extreme agitation of an overgrown ſea, would have expoſed to the greateſt dangers a ſhip that had not poſſeſſed the excellent qualities of the SOLIDE. She was then directing her courſe to double the Cape of GOOD HOPE; and it ſeemed that the conſpired elements were, in ſome meaſure, diſpoſed to juſtify the old name of STORMY CAPE, which the Portugueſe navigators, who firſtattempted to double it, had impoſed on that famous promontory. This was the ſeaſon when the winter begins at the CAPE; and it is well known that the Dutch did not ſuffer their ſhips to remain in TABLE Bay beyond the 15th of May: all their veſſels were bound to repair, at that period, to FALSE BAY, where they are completely ſheltered from

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the north-weſt winds, which blow with violence, often with fury, during the whole winter. The SOLIDE kept conſtantly lying to during the gale. Captain CHANAL obſerves, on this occaſion, that when a ſhip joins ſtrength to other qualities, to lie to appears to him preferable to ſcudding, according to the expreſſion of the Engliſh ſeamen; he reckons that the ſituation of a ſhip is rendered leſs critical by lying to: whereas in apparently avoiding danger, by running before the wind and ſea, a veſſel is no leſs expoſed the ravages to of the former, and ſhe runs the riſk of being overtaken and pooped by the waves which preſs and precipitate themſelves againſt her ſtern.

The weather, which cleared up on the morning of the 12th, admitted of the land being perceived to the northward; and it was rather high: it was judged to be MOUNTAIN Cape, ſituated a hundred leagues to the eaſt by north of Cape AIGUILLAS.

A calm, which had ſucceeded the gale, at a quarter paſt nine o'clock, allowed alſo of taking lunar obſervations, the mean reſult of which reduced to noon, gave 21° 49′ for the longitude, and confirmed a great error in the reckoning, an error which the ſight of the land had already indicated: according to the dead reckoning, deduced from the reſult of the obſervations of the 8th, the longitude of the ſhip muſt have been 24° 48′; thus, in the ſhort ſpace of four days, the error *aſtern* was 2° 59′, or forty-nine leagues, which the ſhip had been carried to the weſtward beyond what the reckoning had implied.

If we recapitulate all the errors in the ſame direction ſince the departure from the Iſle of RÉUNION, on the 21ſt of April in the evening, we ſhall find that the ſum of theſe errors, in the ſpace of twenty days and a half, was

6° 30′,

6° 30′, or about one hundred and twelve leagues *. When we reflect that navigation *by account* or *dead reckoning*, is ſtill ſubject, at the end of the eighteenth century, to ſimilar miſtakes, we ceaſe to be aſtoniſhed that the geographical poſitions, given, after paſſages of ſeveral months, by the firſt navigators of the GREAT OCEAN, to iſlands of which they made the diſcovery, have been ſometimes five or ſix hundred leagues in error. But ought we not, at the ſame time, through the impulſe of juſt gratitude, to pay a well-merited homage to the arts and ſciences, which, by withdrawing us from the empire of arbitrary opinion, have furniſhed us with ſure means of guarding againſt the dreadful effects of an uncertainty, to which the moſt ſkilful ſeaman in vain oppoſed his knowledge and long experience.

The errors in the latitude had, within theſe few days, been no leſs remarkable than thoſe in the longitude: the obſervations ſhewed that, from the 9th to the 11th, the ſhip had been carried to the ſouthward, 1° 11′; and from the 11th to the 12th, 32 minutes; thus in the ſpace of three days, the ſum of the errors in this direction was 1° 43′, or thirty-four leagues one-third.

If we combine together the error of the longitude, which was forty-nine leagues, during theſe laſt days, with that of the latitude, thirty-four leagues one-third, it will be found that, in the ſpace of three days, the ſhip, driven out of her apparent courſe by the movement of the waters, was carried ſixty leagues to the weſt 35° ſouth: this is at the rate of twenty marine leagues in twenty-four hours, or upwards of a common league an hour †; while, on the contrary, owing to the natural conſequence of the direction, and the vio-

* The Reader may convince himſelf of this, by caſting up the ſum of the errors *aſtern*, from the 21ſt of April to the 12th of May. (*See* at the end of the NOTES, the *Table of the effect of the currents.*)

† *See* Note LXVI.

lence of the wind which blew from the weſt, varying towards the north, the ſhip, lying to, ought to have been drifted towards the eaſt-ſouth-eaſt and ſouth-eaſt. We are therefore juſtified in concluding that, but for the reſiſtance which the direction of the wind and waves muſt have oppoſed to the action of the current, the effect of the latter would have been ſtill greater; and it is, no doubt, to the ſtruggle of theſe oppoſite powers, that muſt be attributed the exceſſive agitation of the ſea during the gale of wind. We may preſent, in ſupport of this conjecture, what Captain CHANAL mentions in his journal: that on his return from INDIA in 1789, on board the Tuſcan ſhip, IL. GRAN DUCA DI TOSCANA, he experienced in the ſame latitude, an effect of the ſame current, ſtill much more conſiderable than that of twenty leagues a day, ſince, in the ſpace of twenty-one hours, the ſhip was carried thirty-five leagues to the ſouth-weſt 3° ſouth. The current was no longer felt when they had paſſed Cape TALHADO, ſituated to the weſt-ſouth-weſt of MUSCLE BAY. The Tuſcan ſhip had ſailed at the ſame diſtance from land, twelve, fifteen, and twenty leagues, at which Captain MARCHAND had kept.

On the 13th, at noon, our navigators were aſſured by the obſervation of the ſun's meridian altitude, that the effect of the current which, on coming out of the MOSAMBIQUE Strait, ought to ſet to the ſouthward, had no longer acted on the ſhip, ſince, being more advanced towards the weſt, ſhe had been ſheltered by the ſouthern lands of AFRICA; for, on comparing the latitude obſerved with that which had been deduced from the dead reckoning, it was found that the ſhip, very far from having been carried to the ſouthward, had, on the contrary, been drifted 17 minutes, or five leagues and two-thirds, to the northward; this might be attributed to a ſtrong ſwell from the ſouth-weſt, which muſt have driven her towards that ſide. Some lunar obſervations, taken at fifty minutes after ten in the morning of this ſame day, had

likewiſe proved that, in the interval between the 12th and the 13th, the currents had ceaſed to ſet to the weſtward *.

In the night between the 13th and the 14th, the SOLIDE carried away her main-yard, while the watch were employed in cluing up the topſails, in a ſquall that was not ſufficiently ſtrong to cauſe this accident: it was ſuppoſed to have been ſprung during the gale of wind; however, it was expeditiouſly replaced by a ſpare yard.

From ſeveral obſervations made on the 15th and 16th, it was concluded that at noon on the latter day, the ſhip was in longitude 17° 47′, and latitude 35° 44′. Since the obſervations of the 12th and 13th, the differences between the longitude obſerved and that by account, had been ſo ſmall, that it might be imagined that at leaſt a part, or perhaps the whole of theſe differences, belonged to the trifling error which an obſerver cannot be aſſured of guarding againſt in the obſervation, or to the error which may ſtill be found to affect the aſtronomical tables that are employed in the calculation of the longitudes deduced from the moon's diſtance from the ſun or ſtars.

We are therefore juſtified in thinking that, in the interval from the 12th to the 16th, the differences between the reſults of the dead reckoning and thoſe of the obſervation, were by no means occaſioned by the effect of the currents which had maſtered the ſhip during the preceding days †.

Captain MARCHAND, having found by the obſervations of the 16th, that, at noon on that day, he was under the meridian of Cape AIGUILLAS, and fifteen leagues to the ſouthward of that cape, ſteered north-weſt, in order to

* *See* Note LXVII.

† *See* Notes LXVIII and LXIX.

make

make the Iſland of St. Helena, where he intended to paſs twenty-four hours, in order to procure ſome refreſhments for his crew; and, in concert with Captain Chanal, he employed himſelf in this run in aſcertaining the route of the ſhip by the uſe of aſtronomical obſervations which, in the courſe of the voyage, had conſtantly guarded him againſt the uncertainties and errors of the dead reckoning.

The obſervations of the 25th of May gave 4° 42′ eaſt longitude, and proved that, in the ſpace of the laſt nine days, the ſhip had been carried to the weſtward 1° 6′, beyond the reſult of the dead reckoning*.

Thoſe of the 28th ſhewed that the error on the ſame ſide, had been, in three days, 1° 9′ †.

On the 29th, at noon, the longitude of the ſhip, deduced by the twenty-four hours' dead reckoning, from that which had, on the noon of the preceding day, been given by the obſervations made that ſame day, was 0° 15′ weſt from Paris, and the latitude, obſerved at the ſame inſtant, 20° 52′ ſouth. Thence it was concluded that at half paſt ten o'clock, in the morning of the 29th, the Solide had been under the firſt meridian of France, under which ſhe had already paſſed in the Mediterranean, after her departure from Marseilles, on the 19th of December 1790: thus, in the ſpace of ſeventeen months and ten days, or only thirteen months and a half, deducting the time paſſed at anchor, at the different anchorages, and the length of the ſtay at the Iſle of France, the ſhip had circumnavigated the globe in the direction of the diurnal revolution of the ſun, or to expreſs myſelf more correctly, in the inverſe direction to the diurnal revolution of the earth: and if,

* *See* Note LXX. † *See* LXXI.

on

on his arrival at MACAO, Captain MARCHAND had not added a day to the computation of time, he muſt have added it here, in order to agree again with the date and the calendar of the meridian of PARIS.

The obſervations for the longitude on the 29th, proved that, in the laſt twenty-four hours, the currents had acted feebly in increaſing the ſhip's progreſs by account towards the weſt *; and thoſe of the 30th even ſeemed to indicate a progreſs ſtill ſmaller by 1 minute towards that ſide, than was given by the dead reckoning †.

But if the movement of the waters had no longer acted in the direction of the longitude, their action occaſioned conſiderable errors in the direction of the latitude: the obſervations ſhewed that, in the interval of four days, from the 30th of May to the 3rd of June, the currents had carried the ſhip 33 minutes, or thirty-three miles to the ſouthward ‡.

Half an hour before noon of this latter day, our navigators had the firſt ſight of ST. HELENA, bearing weſt by ſouth, at the diſtance of about twelve leagues; and it is at this diſtance, and in this direction, that the iſland ought to have borne from the ſhip, according to the dead reckoning, deduced from the longitude which had been determined on the 30th of May by obſervations of the diſtances of the ſun and moon. This ſituation being aſcertained left little doubt that, the next day in the courſe of the forenoon, the ſhip might caſt anchor in the road of JAMES TOWN, ſituated about the middle of the north-weſt coaſt of the iſland.

* *See* Note LXXII. † *See* Note LXXIII. ‡ *See* Note LXXIV.

On

On the 4th, at nine o'clock in the morning, SUGAR-LOAF Point bore weſt ſouth-weſt, and the extremity of the moſt eaſtern land in ſight bore directly ſouth. After having hoiſted out the boats, and doubled the north point, Captain MARCHAND ſtood in for the road under the topſails, by the help of a light breeze from ſouth-eaſt to eaſt-ſouth-eaſt; and at half paſt ten o'clock, the SOLIDE came to an anchor off JAMES TOWN, in thirteen fathoms, over a bottom of fine gray ſand; SUGAR-LOAF Point bearing eaſt 31° 45′ north, MUNDEN's Point, ſouth 20° 30′ eaſt, and the flag-ſtaff of the governor's houſe, ſouth 9° 15′ eaſt.

Captain MARCHAND found at the anchorage two Engliſh Eaſt-Indiamen; and, a few hours after his arrival, a ſhip which he had met with at ſea likewiſe came and anchored in the road.

I ſhall not here terminate what concerns the SOLIDE's run from the Iſle of RÉUNION to ST. HELENA, without ſhewing, both with what exactneſs ſhe made the land on this latter iſland, and to what a dangerous error ſhe would have been expoſed, had not the dead reckoning been rectified by aſtronomical obſervations.

The laſt obſervations for the longitude had been made on the 30th of May; and it was from this fixed point that Captain MARCHAND ſteered for making the land. In applying to the longitude determined by theſe obſervations, the progreſs by account towards the weſt ſince that period, a progreſs which he had reaſon to think ſufficiently exact, ſince, during theſe latter days, the currents had ceaſed to act on the ſhip in the direction of the longitude, we find that the longitude of the ſhip, in ſight of JAMES TOWN agrees, *to a minute*, with that which had been fixed for that town by NEVIL MASKELYNE, the aſtronomer royal of GREENWICH. This extreme preciſion

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is, no doubt, an effect of chance, ſince Captain MARCHAND was obliged to employ the dead reckoning for the laſt five days of the paſſage, and ſince this calculation might be affected by ſome error: but let us ſee in what longitude the ſhip would have been ſuppoſed to be if, in ſailing only from within ſight of the coaſt of AFRICA, on the 9th of May, he had been under the neceſſity of directing his courſe by the dead reckoning.

On the 4th of June, Captain MARCHAND, would have reckoned that he had arrived at 3° weſt longitude, when he had already reached 8° 4′: the error *aſtern* would then have been, after *twenty-five days* only, 5° 4′, which, in the parallel of ST. HELENA, anſwer to upwards of *ninety-ſeven* leagues: but if, as that was poſſible, and has often happened, he had not made the coaſt of AFRICA, but had made a direct run, from the Iſle of RÉUNION to ST. HELENA, the error *aſtern*, after *forty-three* days, the length of a very ordinary paſſage, would have been 8° 35′, or upwards of *one hundred and ſixty-ſeven leagues* *.

In order to make the reader ſenſible what fatal conſequences might have enſued from an error *aſtern* of upwards of five degrees, which ſtill remained, at the time of making the land on the iſland of ST. HELENA, notwithſtanding the correction of 3° 30′, made, twenty-five days before, within ſight of the coaſt of AFRICA, it will be ſufficient to obſerve that, in the perſuaſion in which Captain MARCHAND muſt have been that the ſhip was ſtill near *one hundred leagues* to the eaſtward of ST. HELENA, it was poſſible that if, in coming to ſeek this ſmall iſland, he had not kept exactly in its parallel, he would not have perceived it during the night, and that, in the dark, he would have paſſed it without ſuſpecting it: and it was the more to be feared that he would not be able to keep in a given parallel, as in the

* *See* Note LXXIV.

latter part of the run, the ſhip had been conſtantly carried to the ſouthward, and ſometimes at a conſiderable rate in the interval of twenty-four hours. Beſides, it is well known that, in the parallel of St. Helena, the winds blow conſtantly from the points of the compaſs near the eaſt; and it is well known too that there is no longer a poſſibility of getting again to windward of the iſland, if a ſhip has once paſſed its meridian: I ſhall add that the ſteadineſs of the winds here preſents an additional danger; for if, in conſequence of an error in the longitude, a veſſel ſhould happen to be hemmed in during the night on the windward coaſt of the iſland, this iron coaſt affords no other proſpect than that of ſhipwreck, without any hope of ſafety either for the veſſel or for the people.

As the road of St. Helena is little frequented by the French, to whom, however, it may be important to be acquainted with it, and as it is ſo well known to the Engliſh, that, in the accounts of their voyages, they diſpenſe with entering into any detail reſpecting the anchorage, I have thought that it would be uſeful to preſerve the remarks which Captain Chanal was enabled to make, as well in regard to the precautions to be taken, as to the courſe to be held, by a ſhip that intends to anchor in this roadſtead.

The Iſland of St. Helena is ſufficiently high to be diſcerned, in clear weather, at the diſtance of twenty leagues. It preſents, at the firſt aſpect, nothing but a heap of ſteep rocks, ſeparated by narrow and deep vallies. The anchorage, as has been ſaid, is ſituated on the part of the coaſt that faces the north-weſt: and as the iſland is placed in the region of the trade-winds, it is always neceſſary to make the land to the northward of this part, and to ſteer for Sugar-Loaf Point, the moſt northern of this coaſt: firſt, you muſt range very cloſe to this point; near it, there is no danger to be dreaded; the

the coaſt every where is bold and ſafe. On SUGAR-LOAF Point is ſeen a ſmall fort, bearing this inſcription, which is a warning to ſhips coming into the roadſtead: "*Send the ſhip's boat aſhore**." From this point, a boat may be diſpatched in order to announce to the governor the ſhip's arrival. Captain CHANAL ſays he was told that if the commander of a veſſel neglected to conform to what is preſcribed in this reſpect, ſhe would be expoſed to be fired at by the fort: Captain MARCHAND was unable to comply with this formality till after he had anchored in the road, and yet the fort did not fire.

After you have paſſed SUGAR-LOAF Point, you continue your courſe under eaſy ſail, till you are arrived at the anchorage.

From this firſt point, you perceive the ſhips that may be lying in the road, and you ſteer for them: if there be none there, which is very ſeldom the caſe, you ſhould ſteer ſo as to paſs at a little diſtance from MUNDEN's Point, where is built a ſmall fort by which it may be known. It is neceſſary to range cloſe along the land, if you do not wiſh to be forced to ply to windward in order to reach the anchorage: you have nothing to fear but the ſqualls that come from the two vallies ſituated between SUGAR-LOAF and MUNDEN's Points: you muſt therefore carry little ſail, and ſtand by the topſail haliards. Each of theſe vallies is defended by a battery of cannon.

JAMES Valley, in which JAMES Town is ſituated, preſents itſelf immediately after MUNDEN's Point. As ſoon as you begin to diſcover the flag-ſtaff of

* I have been told that this notice is there written in three languages, Engliſh, French, and Portugueſe.

the governor's houſe, you may let go the anchor; you will have from ten to twenty fathoms water, according as you have anchored nearer to or farther from the ſhore; but if you anchor in ten fathoms, bringing the flag-ſtaff of the governor's houſe to bear ſouth-eaſt 6 or 7° ſouth, you will be nearer to the landing-place and to that for filling water.

It is ſufficient to moor with a ſtream anchor which muſt be carried to the north-weſt by the compaſs. The ſea-breezes, from the ſouth-weſt to the north-weſt, are here very rare: and if they happen to blow, they are always very faint: only, in this caſe, you experience a heavy ſwell which cauſes a violent ſurf on ſhore.

It will not, undoubtedly, be uſeleſs to French navigators to add to theſe merely nautical directions various particulars important to be known, which are neither to be found in the deſcriptions that have been given us of the Iſland of St. Helena, by Captain Cook*, and George Forster†, nor in the more ancient Journals of William Dampier‡, to whom maritime nations are indebted for the firſt accounts of voyages from which it is poſſible to obtain exact information.

James Town is built in the bottom of a narrow valley, commanded by two hills. A battery which occupies the whole breath of this valley, defends the approach to it, and protects the anchorage. Some redoubts, towards the ſea, and forts erected on the ſlope of the adjacent hills, add to the

* *Hawkeſworth's Compilation. Cook's Firſt Voyage.* Vol. III. page 794 to 798.—*Cook's Second Voyage.* Vol. II. page 270.

† *George Forſter, A Voyage Round the World,* &c. Vol. II. page 557 to 570.

‡ *W. Dampier, A Voyage Round the World,* &c. Vol. I. page 544 to 548, *Knapton's* edition, 1699. 8vo.

defence

defence of the place and to the protection of the roadſtead. A garriſon of five hundred men is maintained for the guard and the duty of theſe different works, as well as for the police of the iſland. Landing appears impracticable under the fire of the batteries in front, the lateral redoubts, and the commanding forts. The enemy who ſhould intend to attack St. Helena, can do no more than attempt a bombardment, under cover of his ſhips of the line. The enterpriſe would at leaſt be hazardous, if not altogether raſh; and the deſtruction of the town would not involve the ſurrender of the iſland; for it is doubtful whether a deſcent could be effected till after having reduced the forts that command the valley: and the commanding ſituation of theſe forts is ſuch, that they have little to dread from the effect of the artillery of ſhips which could cannonade them only at a diſtance, and firing directly upwards, while the forts would fire on the ſhips directly downwards, and make uſe of red-hot balls and ſhells, with a moſt deciſive advantage. Neither do the other points of the north-weſt coaſt, more than thoſe of the windward and leeward coaſts of the iſland, preſent any facility for a debarkation, and on thoſe which appear leſs inacceſſible, batteries or redoubts well-ſituated and commanding the ground, ſtill add to the difficulties, almoſt inſurmountable, which nature ſeems to have taken a delight in multiplying on the whole circumference of the iſland.

Within theſe few years, there has been conſtructed, as near as poſſible to the landing-place, a new fountain, by means of which a ſhip completes her water with all the facility and diſpatch that can be wiſhed for on the moſt extraordinary occaſion. The caſks are landed and re-ſhipped very eaſily by means of a crane, under which the long-boat comes alongſide the quay without danger. For want of a long-boat or launch, a raft or ſtring of caſks may be formed, and towed on ſhore, and from the ſhore on board, by the ſmalleſt boat.

Each veſſel pays for the duty of anchorage, five pounds ſterling, or twenty dollars, if ſhe fills more than twenty caſks with water; three pounds, or twelve dollars, if ſhe wants only that quantity or leſs. Foreign veſſels are not taxed at a higher rate than that which is required even from the ſhips belonging to the Engliſh Eaſt-India company.

This company have, in the Iſland of St. Helena, of which they are proprietors, ſtorehouſes ſupplied with all the rigging, furniture, ſpare ſails and maſts, that a ſhip can ſtand in need of after a long voyage, or after a gale of wind that has occaſioned her ſome damages. James Town is a naval ſtorehouſe, in the middle of the South Atlantic Ocean, open indiſcriminately to ſhips belonging to the nation and to foreigners. The company, in delivering the articles which they hold in reſerve for the wants of navigators, put on them, for their own profit, an increaſe of fifty per cent. on the prices of Europe. But a ſhip that ſhould have occaſion to heave down or get in new lower maſts, would not find a poſſibility of making good thoſe great defects; however, ſhe might there procure topmaſts.

The reſources which this iſland preſents to navigators are not confined to ſupplies of naval ſtores: the attentions of the company have likewiſe provided for the means of huſbanding for them ſuccour in point of proviſions. An unprecedented drought, which, in 1790 and 1791, ſpread deſolation through the iſland, has for a time deſtroyed part of theſe reſources; but when we are acquainted with the laborious activity of the inhabitants who cultivate this rock, and we calculate the intereſt of the company, we are perſuaded that this wound will ere long be healed, and perhaps is ſo already. Captain Chanal, who had touched at St. Helena in 1789, tells us that, at that period, were reckoned there three thouſand head of oxen, a conſiderable number of ſheep, goats, and poultry; that vegetables of all ſorts, and of

the beſt quality, were to be had there in abundance; that potatoes were very common, and water-creſſes propagated to ſuch a degree that they were ſold by the ſack. The iſland was enabled to furniſh annually to the ſhips that put in here five or ſix hundred oxen. The examination took place in the month of January of every year; five or ſix oxen might be delivered to each veſſel: and the number was carried to ten or twelve for ſhips that had ſick on board, or extraordinary wants. But, in order to prevent all abuſe, and maintain an equal diſtribution, the captains were bound to addreſs their demand to the governor; and the latter regulated the number of oxen to be delivered to each ſhip.

Such was the ſtate of this colony before 1790; but the two years of drought, and the want of fodder and grain that was the conſequence of it, had occaſioned the death of a third of the oxen, and deſtroyed the greater part of the ſheep, goats, and poultry. In 1792, there was as yet granted only one ox in caſe of the moſt extreme want; and although the Governor, Mr. Brooke, had manifeſted to Captain Marchand the beſt diſpoſition for gratifying his requeſts; although he had made him the moſt obliging and the moſt ſincere offers, and had loaded him with civilities, our navigators could obtain only ſix ſheep, a few potatoes, and ſome ſacks of herbage, but not a ſingle fowl.

There is no bazar or public market at St. Helena; a ſtranger is obliged to apply to ſome inhabitant in order to procure the proviſions of which he ſtands in need, with the exception of oxen; but the price of every article is fixed by a regulation; and the governor takes the ſtricteſt care that ſtrangers are neither cheated nor ſuffer extortion *.

I ſhall

* Captain *Chanal*'s journal gives us the prices of eatables in the month of July, 1789; it may be uſeful to preſerve the memorandum of this, becauſe it is to be hoped that after a few years of abundance

I ſhall not undertake to give a minute deſcription of the Iſland of ST. HELENA, already known by the journals of the Engliſh navigators: GEORGE FORSTER has taken particular pains to deſcribe the nature and the productions of the ſoil; and THOMAS RAYNAL * has collected into a ſingle picture the principal paſſages ſcattered in the different works that I have quoted †. I mean only to preſent the iſland under general points of view, and to bring forward a few facts, a few particulars, ſome of which belong to hiſtory, ſome to general phyſics, and others to politics.

DON JOAO DA NOVA GALEGO, a Portugueſe Admiral, made the diſcovery of ST. HELENA on the 21ſt of May 1502, on the day of the ſaint of that name. The Dutch, who, in the ſequel, conquered the conquerors of INDIA, made themſelves maſters of the ſmall ſettlement which the latter had formed on the

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abundance ſhall have repaired the loſſes of the iſland, proviſions may fall again to the price at which they were obtained before the years of drought.

An ox, weighed alive, coſt four pence half-penny *ſterling* the Engliſh pound; which amounted to 9 ſous *tournois*.

Ditto, weighed by quarters, 6 pence *ſterling*, the pound, or 12 ſous *tournois*.

A goat, ſmall and lean, a dollar and a half.

A ſheep 2 dollars and a half.

Poultry, large and ſmall, 18 *ſhillings*, or $3\frac{1}{3}$ dollars the dozen.

Water-creſſes and herbage, a dollar the ſack.

Potatoes, 2 dollars the Engliſh hundred cwt. of 105 *French* pounds.

When Captain *Chanal* was at *St. Helena*, in 1789, he learnt that, from the month of January to that of July of this year, eighty ſhips of all nations had anchored in the road, and nine were lying there at that very time: all of them had been ſupplied according to their wants, and yet the laſt comers found every thing that they had occaſion for; poultry only were beginning to grow ſcarce; but the quantity neceſſary for each of the ſhips could yet be procured. When he returned thither 1792, the loſſes which the inhabitants had ſuſtained, and the ſcarcity of proviſions united to raiſe the price of thoſe which the iſland could ſtill furniſh; and every thing was paid for at double the rate of 1789; a ſheep $4\frac{1}{3}$ dollars, a cwt. of potatoes $2\frac{1}{2}$ dollars.

* *Hiſtoire Philoſophique des Deux Indes*, Vol. II. page 207 to 209. *Pellet*'s 8vo. edition. Geneva, 1780.

† *See* page 132, Notes *, †, ‡, in this Volume.

iſland,

iſland, whither they had already conveyed goats, hogs, and various kinds of poultry. St. Helena afforded a place for procuring refreſhments, a ſafe roadſtead to ſhips coming from Asia, or the eaſtern coaſt of Africa; but the Dutch thought proper to abandon it after Surgeon Van-Riebeck had, in 1650, induced their East-India company to adopt the plan of a ſettlement much more important, that of the Cape of Good Hope, a ſituation which the Portugueſe had neglected, becauſe they were not ſenſible of the advantage of it; a ſituation, on account of which England has ſince always envied Holland, which ſhe has at length contrived to get poſſeſſion of by ſurpriſe, and which the commercial nations muſt wiſh to ſee ſoon return under the domination of the trading company who, at the ſouthern extremity of Africa, founded an European colony, and one of the moſt conſiderable towns of that part of the world.

The Engliſh eagerly ſeized on the Iſland of St. Helena, which the Dutch abandoned; but the latter could not ſee without jealouſy, nor without uneaſineſs, their rivals in commerce occupy a poſt with the utility of which they were acquainted: they endeavoured to take it from them, ſolely that the former might not poſſeſs it; and, in 1672, they ſucceeded.

But ſhortly after, the ſame motive that induced the Dutch to wiſh to deprive the Engliſh of it, induced the latter to make an effort to retake it. Captain Munden was intruſted with the expedition. He landed in a ſmall cove, where it appears that the Dutch had not conceived that a debarkation was practicable, for they had neglected to erect there any ſort of fortification; and, before the beſieged ſuſpected that a landing was effected, the Engliſh had already reached the ſummit of the hills that command the town; and, from theſe heights, they battered the little fort which ſoon capitulated and ſurrendered.

Since that period, the poſſeſſion of ENGLAND has not been diſturbed.

The Iſland of ST. HELENA is ſituated three hundred and thirty leagues from Cape NEGRO * of the Old Continent, and ſix hundred leagues from Cape SANT AGOSTINHO † of the New. It appears to be only the calcined ſummit of a large inſulated mountain, the part of which that ſhews itſelf above water muſt, according to the dimenſions aſſigned to it in the journal of COOK's firſt voyage, be twelve leagues in length, by ſix in breadth ‡; and

* Weſtern coaſt of *Africa*, in about 16° ſouth latitude.

† Coaſt of *Brazil*, in about 8° 40′ ſouth latitude.

‡ I am very far from vouching for the accuracy of theſe dimenſions; I report them out of reſpect to the name of *Cook*, ſuch as they are to be found in *Hawkeſworth's Compilation*, *Cook's Firſt Voyage*, Vol. III. p. 391; they differ greatly from thoſe which ſeveral charts have given to this iſland.

If there be an error, as I think there is, it is far from being proved that the error belongs to *Cook*, whoſe exactneſs is known; but we cannot have the ſame confidence in the compiler, who is frequently found in fault.

What might induce us to imagine that the dimenſions given in *Cook*'s journal are greatly exaggerated, is that it is there mentioned, that, while the *Endeavour* lay in *James Town* Road, *Mr. Banks* "*improved the time in making the complete circuit of the iſland, and viſiting the moſt remarkable* "*places upon it.*" I obſerve that the ſhip anchored on the 1ſt of May at noon, and that ſhe ſailed again on the 4th, at one o'clock in the afternoon: ſuppoſing that Mr. *Banks* employed, in his excurſion, the three whole days, and that, during theſe ſeventy-two hours, he took no reſt, this time will ſtill appear inſufficient for making the circuit of the *St. Helena* of *Cook*'s journal, and viſiting the remarkable places upon it; for an iſland that is ſuppoſed to be *twelve* leagues long by *ſix* broad, and whoſe form differs little from that of an oblong ſquare, muſt be *thirty-ſix leagues in circumference*, without reckoning the ſinuoſities which muſt ſtill lengthen it.

George Forſter, (Vol II. page 570 of his journal) ſays that the greateſt extent of the iſland is nearly *eight miles*, and the circuit above *twenty*: theſe dimenſions are ſo far from agreeing with thoſe aſſigned to it by Captain *Cook*'s journal, that I ſhould be almoſt tempted to ſuppoſe that Mr. *Forſter*, who is a German, meant *German miles* of fifteen to a degree; the eight miles of extent would, in that caſe, anſwer to $10\frac{2}{3}$ French and Engliſh leagues of twenty to a degree; and the *twenty miles* in circuit, to $26\frac{2}{3}$ leagues. If it were ſuppoſed that Mr. *Forſter* had expreſſed himſelf in *marine miles* of 60 to a degree, the length of the iſland would be only $2\frac{2}{3}$ leagues: this is that which the charts of the Dutch who, formerly poſſeſſed *St. Helena*, as well as ſome French and foreign charts, have given it; but I think this length too little.

Dampier (*a Voyage Round the World*, Vol. I. p. 544) merely ſays that *St. Helena* is *nine* or *ten leagues* in length: this navigator always expreſſes himſelf in *marine leagues* of 20 to a degree: theſe dimenſions would come near to thoſe given it by *Cook*'s journal.

nothing

nothing announces that it has belonged to a chain of high lands which has been ſwallowed up by the waters; for, at a very ſmall diſtance all round the iſland, the ſea is unfathomable: and although, for three hundred years paſt, the part of the ATLANTIC OCEAN where it is ſituated, has been ploughed and croſſed in every direction, by ſhips of all the nations that frequent this ſea, no other iſland has been met with, on a circumference of two hundred and thirty leagues radius of which ST. HELENA would be the centre, that is to ſay, on a ſpace of near fourteen hundred leagues in circuit.

It may be remarked that *ſouth* of the equinoctial line, in the ATLANTIC OCEAN, all the iſlands are *ſolitary*, ſcattered, and placed at too great diſtances from each other for it to be poſſible to ſuppoſe that they belong to the ſame chain; while *north* of the line, in this very ocean, the iſlands are diſpoſed in *groups*, known by the names of the CAPE DE VERD Iſlands, the CANARY Iſlands, and the AÇORES or Weſtern Iſlands. The contrary is ſeen in the GREAT OCEAN to the weſt of AMERICA; it is *ſouth* of the equator that are ſituated all thoſe archipelagoes of low iſlands and high iſlands, with the ſituation of which modern voyages have brought us acquainted; and *north* of the line, with the exception of the archipelago of the SANDWICH Iſlands, all the iſlands are *ſolitary*, and thrown at great diſtances from each other: it is only at the MARY ANNE Iſlands, ſituated two hundred leagues to the eaſtward of the PHILIPPINES, the northern part of the great archipelago of ASIA, that the iſlands begin to form a chain, or to be grouped. To what phyſical cauſe is to be attributed this difference between the diſpoſition of the Iſlands of the ATLANTIC OCEAN which ſeparates EUROPE and AFRICA from AMERICA, and that of the Iſlands of the GREAT OCEAN which ſeparates the latter from ASIA? Why, on the one hand, are the ſcattered iſlands, and on the other, the grouped iſlands, to be found in oppoſition, in the two Oceans, with reſpect to the

equator, although ſituated on parallels nearly equidiſtant from this circle, and under this ſame torrid zone, comprehended between the two tropics, the region of the trade-winds throughout all the circumference of the globe? Why, with circumſtances that are the ſame, do not the ſimilar maſſes correſpond with each other, if, in both hemiſpheres, their formation be the effect of the ſame cauſe? If, as it might be preſumed, ſome great convulſion of Nature, by ſinking ſome lands under the waters, has brought to view others, and has preſerved of the former, only a few ſummits, a few pinnacles which indicate the direction of the chains of their mountains, we muſt then ſuppoſe that, in that part of the ATLANTIC OCEAN ſituated to the ſouth of the equator, and in that part of the GREAT OCEAN ſituated to the north of this ſame circle, immenſe vallies occupy the ſpaces where at this day are ſeen thoſe ſmall iſlands, which, in ancient times, muſt have been lofty mountains, inſulated on thoſe vaſt regions; while, in the parts of both ſeas reſpectively oppoſite, ſome high lands whoſe elevation extended over long ſpaces, have, by the ſummits of their great mountains, formed the large iſlands which we ſee united in groups. Can we ſuppoſe that the maſſes in oppoſition in the two oceans, ſeparated between them by half of the circumference of the earth, and placed at diſtances nearly equal on the one hand to the ſouth, and on the other, to the north of the equator, are neceſſary for the balance of the globe? But the neceſſity of this equilibrium has diſappeared, ſince navigation, puſhed by COOK beyond the ſeventy-firſt parallel ſouth, has demonſtrated that the pretended SOUTHERN CONTINENT which was ſuppoſed neceſſary for balancing the great lands ſituated under the Arctic polar circle and beyond it, has never exiſted but in the imagination of a few natural philoſophers, who, from the receſſes of their cloſets, wiſh to ſubmit to their little hypotheſis, the grand ſyſtem of Nature and the univerſality of her means. At every ſtep that we take on this terraqueous globe, alternately overthrown,

and perhaps both by fire and by water, it ſeems that, inſtead of elucidating the theory of its formation, inſtead of acquiring ſome certain knowledge reſpecting its primitive ſtate, we ſee, on the contrary, darkneſs thicken: and the night of time, which envelops the infancy of the world, ſcarcely ſuffers us to get a glimpſe of the image of the chaos, from which it has been drawn by that univerſal Power who has placed immenſity between his action and the limit of human conceptions; that eternal, immutable cauſe, which has acted only once for ever; ſole principle, inviſible mover, whoſe ſprings, no doubt, it is not given to man to know, and whoſe effects he muſt content himſelf with admiring, without pretending to explain them.

I return to Saint Helena of which the digreſſion that I have indulged myſelf in, has made us loſe ſight.

Although ſolitary in the midſt of the South Atlantic Ocean, the Iſland of St. Helena announces that it owes its origin to the ſame cauſe to which is attributed the formation of the iſlands that compoſe the groups ſituated north of the equator: it preſents, throughout, a picture of ruins: every thing there indicates the action of a ſubterraneous fire, of an eruption, of an earthquake that has overthrown its ſurface, and diſcompoſed its whole maſs. Although ſeparated by large vallies, the oppoſite hillocks exhibit one ſame aſpect, ſhew the ſame ſtrata placed at the ſame heights, and have the ſame direction; while the ſtones, eſpecially thoſe which are found in the bottoms, are calcined and nearly reduced to aſhes. The navigator who makes the land on the windward ſide of the iſland, at firſt perceives nothing but a heap of broken rocks, ſeparated by precipices, the height of which the eye cannot meaſure. Captain Cook ſays that, "in ſailing along "the ſhore, he came ſo near the huge cliffs, that they ſeemed to overhang "the ſhip, and the tremendous effect of their giving way, made him almoſt

"fear

" fear the event*; and, no doubt, it will not be imagined that Captain Cook " was eafily alarmed.

In continuing to range along the coaft that faces the north-weft, you at length difcover a deep valley; this is called Chapel Valley; it refembles a large trench, the opening of which is turned towards the fea, and which, growing narrower, terminates in an acute angle in the interior of the ifland. The ground of the valley prefents fome appearance of verdure; but its flopes, or rather its inclined ramparts, are as fteril, as naked, as the rocks with which the coaft is bounded. It is not till after you have cleared the firft hills, that you find verdure in the vallies, and that portions of cultivated land announce that the foil fit for vegetation waits, in order to yield fuftenance to man, only for his labour to render productive by culture, the arable intervals left between the barren rocks which compofe the furface of the ifland.

The various advantages which St. Helena affords, as well from its fituation and the facility of its defence, as from the produce of its foil, which at this day fuffices for its fcanty population, and would foon fuffice for a greater, have not efcaped the fpeculations of the modern Phœnicians: it is in Chapel Valley, in that angular ditch, that a company of merchants to whom the Britifh government gave up the property of the ifland, have built a town under the name of James Town; it is on the ruins of an Old World, that they have founded a colony entirely Englifh, whofe population amounts to two thoufand individuals, including in this number, about five hundred foldiers, of whom the garrifon of the ifland is compofed, and fix hundred flaves employed in different labours. If the colony has not rifen to the

* *Hawkefworth's Compilation. Cook's Firft Voyage.* Vol. III. page 392. 4to edition.

degree

degree of prosperity to which it might aspire, it is on the sovereign company alone that the reproach ought to bear: in reserving for themselves or for their agents, the greater portions of the productive ground, which are left in pastures for the rearing of the cattle intended for victualling their ships on their passage, they have, by these reserves, limited the progress of industry, which would have employed those very grounds in the cultivation of corn, wines, legumes, and nutritious roots. The activity of the colonists derives the most advantageous benefit from the small quantity of land that their hands are permitted to turn to account; and as the sole traffic that is tolerated by the monopoly of the company, is the sale of fruits, herbage, and other refreshments fit for shipping, the inhabitants must have applied themselves to the only kinds of culture which can insure them some profit. Accordingly all the free lands are assiduously cultivated; and if the crops of the island are not proportioned to the fertility of the soil and to the temperature of the climate, they are at least commensurate to the portion of the productive surface which avarice consents to leave to industry: for, as VIRGIL says,

> " *Labor omnia vincit*
> " *Improbus, et duris urgens in rebus egestas**."

Thus it is that the indefatigable Maltese laboriously extends over the rock which he inhabits, a stratum of vegetable earth that he brought from SICILY; and contrives to convert into a garden of HESPERIDES, a soil which Nature seemed to have condemned to eternal sterility.

* " Then all those arts that polish life succeed,
" What cannot ceaseless toil, and pressing need?"
WARTON.

Two

Two rocks have, by their ſituation on the globe, deſerved to fix the attention, and excite the jealouſy of trading nations: the firſt, which I have juſt deſcribed, thrown into the middle of the ATLANTIC OCEAN between the Equinoctial Line and the ſouth tropic; the ſecond, placed for commanding the ſtrait that ſeparates two parts of the Old World, and connected by a tongue of land to the continent of EUROPE, which it terminates to the ſouth. In both, the labours of art have ſurpaſſed the work of Nature; in the former, in order to fertilize a few portions of land; in the latter, in order to convert an inſulated promontory into an impregnable fortreſs againſt which, and rather recently too, the combined arms of two great powers have miſcarried. Both theſe important poſts are occupied by the ſame nation: the one, by affording to its rich fleets from ASIA, about the middle of their voyage, a port, a place for procuring refreſhments, facilitates the immenſe trade which it carries on with that part of the earth; the other, by giving up to it the gate of the MEDITERRANEAN, puts it in a ſituation to open or ſhut, according to its intereſts, the ſources of the commerce of the Levant to the nations that have not poſſeſſions on this ſea; to fetter, at its pleaſure, the operations of its competitors; and, in caſe of war, to oppoſe the junction of the enemy's fleets which might be aſſembled, partly in the ports of the Levant, partly in thoſe of the weſt coaſt of FRANCE: at the ſame time that, by the maritime forces to which it affords a ſhelter, it preſents an impoſing maſs, ever ready to repreſs the uneaſy activity and check the ſudden equipments of the Barbary powers, who, not carrying on any trade themſelves, and not being able to enrich themſelves, but by piracy, are ſkilful in creating pretexts for declaring war againſt the nations whoſe ſhips are called by trade into the MEDITERRANEAN*.

The

* Some of the Northern powers, in order to maintain peace with the *Barbary* States, and ſave the expenſe of giving convoys to their ſhipping in caſe of war, have, long ſince, determined to

The rocks of St. Helena and Gibraltar would lose all their importance, if, as in past times, the former were possessed by the Dutch, and the latter re-attached to the kingdom of Spain, from which it was dismembered by a surprise, prepared by treachery. But what weight they acquire in the political scale of Europe, when they are united under the power of a nation the most enterprising, of a nation governed by principles inimical to the prosperity of every other; to which, neither mutual convenience, nor the law of nations, nor a respect for property, are obstacles to encroachment and invasion; and which, by force, by artifice, or by corruption, attempts to establish itself wherever some apparent benefit calls its commercial speculations! Have we not seen it contrive to consolidate, by treaties, the settlements which it had usurped on the Muskito shore, and in the Bay of Campeachy; and under the idle pretext of the necessity of cutting, for its manufactures, the wood that grows on those parts of the New Continent, mask the real object of its demands, the preservation, in the centre of the Spanish possessions, of those marts for smuggling, which insure it both the introduction of its merchandise, and the issue by the same channel of a part of the rich produce of the mines of Mexico and Potosi? Have we not seen it ready to run the chances of a war, in order to preserve the contested possession, or rather not to make the restitution of those barren islands, situated in the latitude of the Magellanic Land, of which it hoped to make an emporium of trade in the austral seas, and a point of support and a refreshing-

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to pay to the regencies on the coast of *Africa* and to the King of *Morocco*, a subsidy, or rather an annual tribute, which is always the fundamental clause of every treaty of peace and friendship with those states; this is what may be called *contributing to the fire*. However humiliating this sacrifice must appear, we cannot but approve of the conduct of the nations which have thought proper to submit to it: in fact, in a war with pirates, a trading people has nothing to gain, and every thing to lose; we are forced to purchase their friendship in order not to increase their insolence by triumphs, and their power by pillage.

 place,

place, when-ever it ſhould wiſh to carry war to the weſt coaſts of AMERICA? And when EUROPE was ſcarcely informed that, in the province of SONORA, at CINEGUILLA, at CINALO, and in other regions which extend to the northward of CALIFORNIA, the Spaniards had found new mines that ſurpaſs in richneſs all thoſe which had hitherto been diſcovered in the New World, already this ſame nation had directed its ſhips towards the coaſts that border on thoſe countries; already a ſettlement, which announced itſelf as having no other object than a temporary traffic for furs, was riſing on thoſe lands ſcarcely known, and threatened SPAIN with a ſmuggling trade, the more difficult to check, as a greater diſtance muſt more eaſily conceal from the vigilance of the Viceroy of MEXICO and his lieutenants, ſuch clandeſtine operations, which never fail to be promoted by the ſubaltern ſuperintendants whom it is not difficult to corrupt by intereſting them in the ſucceſs of the fraud. SPAIN has ſucceeded in diſconcerting this new project of the Britiſh government; but let us not imagine that it is relinquiſhed: we might rather foretel that it will be reſumed with ardour, and proſecuted with perſeverance, as ſoon as more favourable circumſtances can inſure its execution *. In ſhort, we ſee at this day the ſame nation treacherouſly avail itſelf of the troubles that agitate a republic not long ſince its friend, but which, weary of the yoke of an ally,

* The treaty which *Spain* concluded with *England*, after the diſpute relative to the ſettlement of *Nootka*, is, properly ſpeaking, only a palliative. The immenſe extent of the Spaniſh poſſeſſions in *America*, the difficulty which their diſtance oppoſes to defence, the means of attack which a power entirely maritime has always at its diſpoſal, no doubt, determined the cabinet of *Madrid* to accede to propoſals of peace. The embarraſſment of the moment allowed not of caſting an attentive look to the dangers of the future: the Spaniards wiſhed for peace; they made it. But this treaty which gives the Engliſh the liberty of eſtabliſhing themſelves and of navigating from Cape *Mendoçino* to *Nootka* Sound, over a length of a hundred and fifty leagues of coaſt; this treaty which goes ſo far as to permit them to approach, within the diſtance of ten leagues, the coaſt ſubject to the domination of *Spain*, is for *England* a ſtep towards the execution of other projects which are ripening in the boſom of ſilence. *Spain* is not, perhaps, ſufficiently convinced that, in reſpect to commerce, the Engliſh are leſs formidable as enemies during war, than dangerous as neighbours during peace.

become its maſter, returns to the liberty to which ſhe was indebted for the rank ſhe held among the great powers of EUROPE, we ſee it invade, both the important ſettlement of the Cape of GOOD HOPE, and the Iſland of CEYLON, ſtill more important from its harbour of TRINCAMALAY, the only ſafe port, in all ſeaſons, that the Indian ſeas can afford to European ſhips; ſeize on the valuable iſlands that produce the ſpices; perhaps, at the time I am now ſpeaking, ravage the opulent city of BATAVIA, if the inſalubrity of its climate, formidable to ſtrangers, and conducive to its ſafety in theſe circumſtances, has not protected it from attack and plunder: and ſhortly, no doubt, we ſhall ſee it, after having expelled the Batavians from the ſeas of ASIA, direct its Indian fleet and army againſt the PHILIPPINES, which, in their ordinary ſtate of nakedneſs, leave little hope that they can oppoſe a long reſiſtance to an enemy encouraged by the facility of his ſucceſſes, and ſtrong from the weakneſs of the means that can be oppoſed to him.

So many conqueſts, added to the immenſe domains which ENGLAND, under the name of her Eaſt-India Company, already poſſeſſes on the continent of ASIA, compoſe for her an ultramarine empire, whoſe territorial ſurface is more than double that of her three kingdoms in EUROPE, and thus tranſmit into the hands of her privileged company, all the rich productions which the eaſt of the Old Continent barters for the metals of the New World *.

I ſhall not ſpeak of the Iſland of TRINADAD, which ſhe has recently acquired by right of conqueſt: we muſt expect that ſhe will ſet it at a very high price, if ever ſhe reſolve to reſtore it; becauſe, being ſituated at the head and to windward of a part of the coaſt which ſpreads over an extent of

* It is proper to remark that, at the time this part of the original work was printed, neither was the conqueſt of *Egypt* achieved by the French, nor had the Engliſh made themſelves maſters of *Seringapatam* and the *Myſore* country.—*Tranſlator.*

twenty leagues, and joins to the Engliſh ſettlements in the Bay of CAMPEACHY, that iſland will, in her hands, become the emporium of an immenſe ſmuggiing trade, which, introducing itſelf by all the points of that long coaſt, will penetrate, through innumerable channels, to the very centre of the Spaniſh poſſeſſions.

As for her trade with the Portugueſe colonies, it is well known that ſhe is not reduced to ſeek oblique means for ſucceeding in it: ſhe leaves to the ſhips belonging to PORTUGAL the care of importing to AMERICA the produce of the Engliſh manufactories, and of thence exporting to ENGLAND the produce of the mines of BRAZIL.

Thoſe who have read hiſtory, and have reflected on reading it, cannot be miſtaken reſpecting the plan which GREAT-BRITAIN has formed, and towards the execution of which, ſince ſhe has occupied a place in the annals of EUROPE, we ſee her inceſſantly aiming, ſometimes openly and by a rapid courſe, more frequently in the dark, and by a winding and imperceptible progreſs. To her, trade is all in all; and this too is the god to which ſhe has always ſacrificed, to which ſhe will ſacrifice every thing, even her very friends and allies: the univerſality of commerce which ſhe attributes, and would wiſh to appropriate, to herſelf; commerce without participation; this is what was, at all times, the object of her meditations, the regulator of her enterpriſes, the aim of her attempts: and the four quarters of the earth are ſcarcely adequate to her cupidity and ambition—EUROPE is witneſs of this! And all EUROPE, petrified in a manner, by enchantment, does not in a maſs take up arms againſt the uſurpation of the commerce of the world! And the Northern Powers leave their uſeleſs ſhips moored in their ports! They all ſeem to tremble before that terrific gianteſs, more impoſing than real, who overhangs the frail and too narrow baſe on which ſhe ſtands; who has

none

none of her great means within herſelf; whoſe political exiſtence is, in ſome meaſure, only a prolonged illuſion; and whom it will be ſufficient to attack in her navy which conſtitutes her ſtrength, in her trade which conſtitutes her wealth, in her Aſiatic poſſeſſions which nouriſh both, to ſee her deſcend again to the inferior rank which the confined extent of her European territory, and the weakneſs of her population, have aſſigned to her by the ſide of the great powers that divide the continent. It has been ſaid poetically, and a thouſand times has it been repeated; but, without a figure, hiſtory proves it by the experience of ages, that

Le trident de Neptune eſt le sceptre du monde.

Let all the nations that are called to ſhare the empire of the ſeas, then awake at laſt to their own intereſt; let them, in order to break this iron ſceptre, form a maritime coalition, formidable from its maſs, juſt in its object; let them unite their flags and their efforts, in order that the OCEAN, which Nature meant to be the property of all, may ceaſe for ever to be the domain of one alone, and that, ſhortly, we may ſee every nation of the continent participate, in proportion to its territory and population, in the general commerce, in the free commerce of the two Worlds *

But it is time for us to rejoin the SOLIDE in the road of ST. HELENA. Captain MARCHAND ſtaid there no longer than was abſolutely neceſſary for providing himſelf with water, and procuring ſuch refreſhments as the iſland was in a condition to furniſh to his ſhip. He had caſt anchor on the morning of the 4th of June; and on the 5th, at half paſt ten in the evening, he ſet ſail for EUROPE. On the 7th, at noon, in latitude 14° 53′, he ſtill perceived

* The ſubject of the *Northern Confederacy* having now been fully and publicly diſcuſſed, we ſuppreſs our obſervations on the above paſſage, which we ſhould, otherwiſe, have thought it our duty to ſubmit to the reader.—*Tranſlator.*

the

the iſland to the ſouthward; he muſt then have been at the diſtance of about twenty-one leagues from it.

A paſſage acroſs the ATLANTIC OCEAN, from the Iſland of ST. HELENA, to the Strait of GIBRALTAR, can preſent no particulars that deſerve to be mentioned: I ſhall confine myſelf to a few remarks relative to navigation.

On the 20th of June, at four o'clock in the morning, the SOLIDE croſſed the line at the twenty-fifth meridian weſt from PARIS.

At this period, Captain MARCHAND began to perceive that the currents ſet to the northward, as had been experienced, the preceding year, north of the line, in paſſing from the CAPE DE VERD Iſlands to Cape HORN; and he expected that, when he could determine the longitude by aſtronomical obſervations, he would find that the ſame currents ſet alſo to the weſtward, as had been in like manner experienced in the former paſſage.

It was not till the 10th of July that he was convinced of it; and he had already got into the latitude of 32° 23′ north. In this parallel, four ſets of obſervations of diſtances of the ſun and moon, the mean reſult of which was reduced to noon, announced that the ſhip had reached the longitude of 46° 27′ weſt, that is to ſay, that ſince her departure from the Iſland of ST. HELENA, ſituated in 8° 9′, the progreſs towards the weſt had been 38° 18′: and as it was only 35° 21′, according to the dead reckoning, it was thence concluded that, in the interval of thirty-four days and a half, the currents had carried the ſhip to the weſtward beyond her apparent progreſs, 2° 57′, which may be eſtimated at fifty-three leagues that the reckoning was *aſtern* of the ſhip's true poſition.

But,

But, at the ſame time that the currents had driven the ſhip to the weſtward, they had alſo driven her to the northward. Their direction towards this latter quarter had not been conſtant till the ſhip had reached the equator; they ſometimes ſet to the ſouthward, and particularly between the parallels of 3° and 1° ſouth of the line: here they ſet towards that ſide, ſixteen miles in twenty-four hours, for two ſucceſſive days; but, from the equator to the parallel of 32° 23′ north, their tendency towards the north was conſtant, and their effect was ſometimes twenty-one, twenty-two, and twenty-eight miles in twenty-four hours; quantities which the real progreſs of the ſhip in latitude was in exceſs beyond her apparent progreſs. The ſum of all the errors towards the north, deducting the errors towards the ſouth, is one hundred and ninety-eight miles or ſixty-ſix leagues: and, in combining the ſixty-ſix leagues with the fifty-three leagues of the exceſs of the real progreſs towards the weſt beyond the apparent progreſs, it will be found, that, in the interval of thirty-four days and a half, the ſhip had been carried in the direction of north-weſt 6° north (which differs little from that which ſhe had followed) eighty-five leagues that muſt be added to her apparent run, in order to have her real run. It may be concluded, from a mean term, that the daily increaſe of her run owing to the effect of the currents, was ſeven miles four-tenths in twenty-four hours*.

Freſh lunar obſervations were, however, made on the 23d, and their mean reſult, reduced to noon, placed the Solide in 34° 32′ weſt longitude: her latitude, at the ſame moment, was 41° 42′ north. According to this poſition, ſhe was one degree and ſome minutes to the weſtward of the meridian of the Iſlands of Corvo and Flores, the moſt weſtern of the

* *See* Note LXXV.

Açores,

Açores *, and on a parallel more northerly by two degrees than that of those islands.

The observations of this day shewed that the currents which, from the 6th of June, the day on which the departure was taken from St. Helena, till the 10th of July, had set to the northward and westward, had not ceased to set to the northward, between the 10th and the 23d of July; but that, in the same interval, they had set to the eastward; that their compound direction had been north 32 or 33° east; and that their effect on the ship's run might be estimated at three miles in twenty-four hours †.

The observations of the 24th confirmed the direction of the currents towards the east ‡.

Others of the 27th, made at twenty-six minutes after four in the evening, gave 25° 32′ of west longitude for noon, and the latitude observed at the same instant, was 41° 13′ §.

On the 2nd of August, at five o'clock in the morning, our navigators had the first sight of the land of Europe, in the vicinity of Cape St. Vincent; it extended from north by east to south by west. The haze did not allow of

* According to the observations made on board the *Isis* in 1769 with a time-keeper:

	°	′	″	
South point of the Island of *Corvo*	33	32	32	west.
North-west point of *Flores*	33	26	34	
South point of ditto	33	32	26	

*Voyage de l'*Isis *à different Parties du Monde*, en 1768 et 1769, *pour éprouver les horloges marines de* Ferdinand Berthoud. *Paris, Imprimerie Royale*, 1773, 4to. Vol. I. page 574 to 576.

† *See* Note LXXVI.

‡ *See* Note LXXVII.

§ *See* Note LXXVIII.

their

their diſtinguiſhing even the extremity of the cape; but yet they might conclude that their diſtance from the coaſt was not more than four leagues.

At noon, they had a diſtinct view of it, and Cape St. Vincent, which the obſervations of Borda, in 1776, have fixed in 37° 2′ 20″ north latitude, and 11° 21′ 36″ weſt longitude *, bore eaſt half ſouth, at the diſtance of two leagues and a half eſtimated by the eye. The Solide's latitude was therefore, at that moment, 37° 3′ 5″ (it was obſerved on board the ſhip 37° 2′) and her longitude 11° 30′ 56″. In comparing this poſition with that which would have been given by the dead reckoning, deduced from the obſervations made at ſea on the 27th, it will be found that, in the interval of ſix days, the movement of the waters carried the ſhip, beyond her apparent progreſs, 1° 26′, or about ſixty-ſix miles to the eaſtward, at the ſame time that it carried her thirty-two miles to the ſouthward. On approaching the Strait of Gibraltar, Captain Marchand expected to experience the effect of an eaſterly current; but the movement of the waters towards the ſouth has a very different cauſe: if we recollect that it was then the beginning of Auguſt, perhaps we ſhall be inclined to attribute this accidental current towards the ſouth, to the melting of the ſnow and ice of Greenland, Iceland, Lapland, Norway, &c †.

The ſight of Cape St. Vincent having made known the true poſition of the ſhip, Captain Marchand directed his courſe for the Strait of Gibraltar.

On the 4th, at five o'clock in the morning, Cape Spartel on the coaſt of Africa bore ſouth-eaſt, at the diſtance of two miles and one-third, eſti-

* Determinations taken from a manuſcript communicated by him.

† *See* Note LXXIX.

mated by the eye. This cape, according to the obſervations of BORDA, made in 1776, is ſituated in 35° 47′ 20″ north latitude, and 8° 14′ weſt longitude: the SOLIDE's latitude was therefore 35° 49′ and her longitude 8° 16′. If this poſition be compared with that indicated by the dead reckoning from the 2nd at noon; it will be ſeen that, in the interval of one day and ſeventeen hours, the ſhip had been carried to the eaſtward, beyond her apparent progreſs towards that ſide, 37 minutes, or thirty miles, and, conſequently, at the rate of ſeventeen miles and a half, or near ſix leagues in twenty-four hours *.

The current towards the eaſt runs here with its greateſt force: confined between the lands of EUROPE, which, from Cape ST. VINCENT, ſtretch from weſt-north-weſt to eaſt-ſouth-eaſt, and thoſe of AFRICA, which, from Cape CANTIN, extend from ſouth-weſt to north-eaſt, the waters diſcharge themſelves into the wide mouth of a ſort of funnel, the orifice of which is the Strait of GIBRALTAR; and in the Strait itſelf, the current acquires the rapidity of a great river flowing majeſtically into the MEDITERRANEAN, and whoſe velocity augments or diminiſhes, according as the oſcillation of the tides raiſes the waters or lowers them: and, indeed, it is not uncommon for ſhips, without being aſſiſted by the wind, ſometimes even with a wind contrary to the courſe, to be carried, in no great ſpace of time, from the ATLANTIC OCEAN into the MEDITERRANEAN.

At ſix o'clock in morning, the SOLIDE entered the Strait with eight other veſſels which were ſteering the ſame courſe: the currents carried her rapidly into the MEDITERRANEAN; and at half paſt ten, ſhe was running up it with a free wind. In ten days, ſhe reached the coaſt of FRANCE; and on the

* *See* Note LXXX.

14th,

14th, at half paſt five o'clock in the evening, ſhe came to an anchor in the inner road of TOULON, and happily terminated her VOYAGE ROUND THE WORLD.

The laſt run of the SOLIDE, from the Iſle of RÉUNION to EUROPE, which is about three thouſand five hundred leagues, by the log, was made in one hundred and fifteen days, including a day and a half ſpent at anchor off the Iſland of ST. HELENA: thus, we may reckon that the ſhip's mean rate of ſailing, during this run, was thirty leagues and a half in twenty-four hours.

Captain MARCHAND's voyage is remarkable from the ſhort ſpace of time which he employed in circumnavigating the globe, directing his route by Cape HORN, and returning by CHINA. The total duration of the voyage, or the abſence of the ſhip from the ports of FRANCE, was twenty months or ſix hundred and eight days: but if we deduct from this number the ſum of the days employed in his ſtay in port at LA PRAYA, LA MADRE DE DIOS, TCHINKITÂNAY, MACAO, and at the Iſles of FRANCE and of RÉUNION, and at ST. HELENA, amounting together to one hundred and ten; and about ten other days loſt, whether off the REVOLUTION Iſlands, in examining them, or off the SANDWICH Iſlands, in procuring refreſhments there; whether in lying to, or in ſtanding on and off on the coaſt of QUEEN CHARLOTTE's Iſlands, while with the long-boat, Captain CHANAL was viſiting CLOAK Bay, COX's Channel, and the harbours and coves comprehended between this northern part of the iſlands and RENNEL's Channel; whether, in ſhort, at anchor in the CHINA Sea, in GASPAR's Strait, and in that of SUNDA, to ſtop tide, when its direction was contrary to the route which it was intended to hold; there will remain only four hundred and eighty-eight days, or ſixteen months and eight days for the duration of the voyage;

and in this ſpace of time, the ſhip, according to the log-book, ſailed fourteen thouſand three hundred and twenty-eight marine leagues; which gives, for the mean day, twenty-nine leagues four-tenths.

I obſerve that the ſhip was not what ſeamen call a *prime ſailer:* built for reſiſting the fatigues of a long voyage, and ſtruggling againſt the waves in bad weather, ſhe was SOLIDE in reality as well as by name; but ſhe poſſeſſed not the qualities that conſtitute a faſt-ſailing ſhip; and her maſts and yards were not in proportion to the body which her ſails had to move: and, indeed, in cloſely examining the log-book, we ſee but a very ſmall number of days in which, with a fair wind, and carrying a preſs of ſail, the ſhip's run exceeded forty leagues. It is not then to the ſwiftneſs of her ſailing that we muſt attribute the ſhortneſs of her voyage; but that having always made direct courſes, in order to repair from one place to another, the itinerary length of each run was materially ſhortened. We may ſuppoſe, without ſtraining the calculation, that, under the ſame circumſtances of weather, a faſt-ſailing veſſel would have obtained a mean ſwiftneſs of thirty-three leagues in twenty-four hours, and that, in the ſpace of four hundred and thirty-four days, ſhe would have run the ſame diſtance of fourteen thouſand three hundred and twenty-eight leagues, for which the SOLIDE was obliged to employ four hundred and eighty eight.

It may be remarked that, although Captain MARCHAND made, as I have ſaid, all his runs by direct courſes; although, by means of aſtronomical obſervations which guarded him againſt errors in the route, he was enabled to ſail with ſafety from one place to another by the ſhorteſt line, yet he was obliged, in order to circumnavigate the globe, whoſe circumference at the equator is only ſeven thouſand two hundred leagues, to traverſe fourteen thouſand three hundred and twenty-eight: that is to ſay, that he

he traverſed, very nearly, the equivalent of twice the circumference of the earth.

When we have made this remark, and we caſt our eyes on the map of the world, we ſee that, if the labour of man, or one of thoſe great convulſions which have ſeparated CALPE from ABYLA, ENGLAND from FRANCE, and perhaps to the northward, AMERICA from ASIA, ſhould ever, on the one hand, cleave the iſthmus which joins the great peninſula of AFRICA to the maſs of the Old Continent, on the other, that which of the two AMERICAS makes one continued land, the Voyage *round the World* would be ſhortened by one half; and the time required for the circumnavigation of the globe would not exceed ſeven or eight months.

And we ſhould be wrong to ſuppoſe that to open a paſſage by water acroſs both continents, if not to ſhipping, at leaſt to merchandiſe, is a work above human power, and the means of which it is given us to diſpoſe. The unanimous teſtimony of the hiſtorians of antiquity and that of the Arabic authors permit us not to doubt that there has exiſted a canal, by which the MEDITERRANEAN and the NILE communicated with the ARABIAN GULF or RED SEA*. And why ſhould not this communication be again opened? Who

* The ancient communication of the *Mediterranean* with the *Red Sea* has frequently been an object of inquiry among hiſtorians and geographers. We find in the *Mémoires de l'Académie des Sciences* (of the year 1702, pages 83 and following of *l'Hiſtoire)* that M. *Boutier*, Conſul of *France* in Egypt, in examining the diſpoſition of the *Delta* at the beginning of this century, remarked the end of a canal iſſuing from the eaſtern branch of the *Nile:* and this obſervation was ſeized by the learned *Guillaume Deliſle* who judged that this end of a canal muſt have been that which anciently formed the communication of the *Mediterranean* and the *Nile* with the *Red Sea.*

" As this ancient communication (ſays *Fontenelle*, the Hiſtorian of the Academy), which M. " *Deſlile* eſtabliſhed for an unqueſtionable fact, is unknown at this day even to ſeveral of the " learned,

Who can now be made to believe that the Moderns cannot accomplish what it was possible for the Ancients to perform? ASIA may again be approximated

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" learned, they were very glad to see the proofs that he had of it; and he gave them so clear, " and taken from places so well known, that all the difficulty is to ascertain why every one has " not remarked them?"

We have, perhaps, more reason at this day than they had in the year 1702, *to be very glad to see these proofs:* there are circumstances which, by a series of comparisons, give things the most ancient the attraction and interest of novelty: we have a curiosity to know what has been done at another time, when we are anxious to know what might still be done.

Deslile has drawn from the historians of antiquity and the Arabic authors the proofs which he gave to the Academy of Sciences; I take them from the *History* of that Society; and it will be sufficient to mention the principal ones.

Herodotus (Book II) says that there was in the plain of *Egypt*, a canal cut a little above the city of *Bubastis*, and below a mountain that ran towards *Memphis*; that this canal extended very far from west to east; that afterwards it turned off to the south, and extended to the *Red Sea*. According to him, this work begun and abandoned by *Nechos*, son of *Psammetichus*, was resumed and completed by *Darius* son of *Hystaspes:* two gallies could pass there abreast. (*Psammetichus* ascended the throne 670 years before Christ, and reigned 55 years: *Darius*, 522 years before *Christ.*)

Diodorus (in the first book of his *Bibliotheca*) gives a description of the canal, which agrees with that of *Herodotus*, from which it differs only in his causing the canal to be left imperfect by *Darius*, to whom some very unskilful engineers represented that the *Red Sea*, being higher than *Egypt*, would inundate it, and in his causing it not to be finished but by *Ptolemy Philadelphus:* he adds that the canal could be opened and shut according as it was necessary for navigation. (*Ptolemy* began to reign 285 years before Christ.) We shall not here enter into a chronological discussion: the canal has existed, the two historians agree on this point; but at what time, or under what reign was it finished? This is rather a matter of indifference as to the question on which we are occupied.

Strabo (1st Book of his *Geography*) agrees in all points with *Diodorus*. He informs us, besides, that at the point of the gulf which is called the *Red Sea*, were two cities *Heroopolis*, and *Arsinoe*, also named *Cleopatris*; and, speaking of the expedition made into *Arabia* by *Ælius Gallus*, the first governor of *Egypt* for the Romans, he says that *Gallus* caused vessels to be built near an ancient canal branching from the *Nile*.

Elmancinus, an Arabic author (Boo kI. Chapter III) says that, under the Caliph *Omar*, about the year 635 of the Christian Era, a canal was made for the conveyance of corn from *Egypt* into *Arabia*; and it is probable that he did no more than repair the old one, the navigation of which might possibly have been abandoned in the decline of the Roman Empire. But, in the year 150 of the Hegira (735 of the Christian Era) *Abugiafar Almanzor*, the second caliph of the *Abbassides*, caused the canal to be stopped up towards the sea.

" After

proximated to EUROPE, from which the discovery of the Cape of GOOD HOPE seems, as it were, to have increased its distance: commerce may again open ancient routes, the track of which is not so effaced that we cannot find it again; its operations may acquire an activity which they will never obtain while that long circumnavigation of AFRICA to which they are subject, shall be the only practicable route by which we can maintain commercial communications between the contiguous lands of the east and west parts of the Old World*.

On

"After this," says the historian of the Academy, "we may dispense with some authorities "which have also been mentioned by M. *Delisle*. Every one is acquainted with the intention "which some princes had had of establishing a communication between the *Mediterranean* and the "*Red Sea*; every one knows that it was overset by the chimerical fear of an inundation; and "as if most readers had been struck by the same fear, they have not seen in authors the entire ex-"ecution of the canal. If ever this junction be renewed, the face of the world would be "changed; *China* and *France*, for instance, would become neighbours; and we should lament "the destiny of those barbarous ages in which Europeans were obliged to make the tour of *Africa* "in order to go to *Asia*."

J. J. Oberlinus, who has given a complete Treatise on the junction-canals of rivers and seas in all ages, mentions and learnedly discusses every thing that relates to the canal of *Ptolemy*, and dispels all the doubts which may ever have arisen respecting the ancient communication from the *Mediterranean* and the *Nile* to the *Red Sea* (See *Jungendorum Marium Fluviorumque omnis Ævi Molimina. Auct. Jer. Jua. Oberlinus*, &c. Argentorati. 1775, 4to edition, pages 39 to 47.)

The reader may also consult the *Description de l'Egypte* by *Maillet*.

* The following passage, which we have taken from that much-admired publication, the *Précis des Evènemens Militaires*, must dissipate every existing doubt as to the situation of the canal between the *Red Sea* and the *Nile*, and convince the reader that, should the French retain possession of *Egypt*, nothing, within the compass of human ability, will be left unattempted to restore the long-lost communication between the *Red Sea* and the *Mediterranean*.—*Translator*.

"The solution of this problem, the existence of the canal, which had joined the *Red Sea* to the "*Mediterranean*, particularly occupied *Buonaparte*; towards the end of November, 1799, he had "detached under the command of General *Bon*, a corps of 1500 men, which had taken possession "of *Suez*; on the 26th of December, he went thither in person, accompanied by *Monge* and "*Berthollet*; he first took a very particular survey of the town, and adjacent coast, ordered "the construction of some new works, provided for the defence of this important post, and made "various arrangements favourable to commerce.

"In

On the ſide of the New, we ſhall not require a cut to be made in the mountains which form the iſthmus of DARIEN, that bridge of communication between the two AMERICAS; we have loſt both the ſecret of HERCULES and that of HANNIBAL; but, on the inſpection of the lands which are ſituated about thirty leagues to the north-weſt of this rocky iſthmus, and on the ſuppoſition that the coaſts of this part of the continent, as well on the eaſt ſea as on the weſt, are diſpoſed and faſhioned as the Spaniſh charts repreſent them to us, it is not ſpeaking at random, perhaps, to ſay that if ſkilful engineers were at liberty to put in practice the means which the ſtudy of hydraulics and mechanics afford them, they would contrive to render navigable the river SAN JUAN, the mouth of which is ſituated on the eaſt coaſt of the Province of NICARAGUA, on the ATLANTIC OCEAN, and which communicates by its ſource with the great lake of that name, which itſelf communicates with the WEST SEA or the GREAT OCEAN, by the fork of RIO PARTIDO (the *divided* River) a branch of which appears to have its mouth in the Gulf of NICARAGUA, and the other in that of EL PAPAGAYO, which belongs to the great ſea*. And

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" In order to remove the remaining doubts, *Buonaparte*, having aſcended the north coaſt, dis-
" covered the entrance of the canal, and followed it for the ſpace of four leagues. Then paſſing
" through Fort *d'Algerond*, croſſing the deſert, and returning by *Belbeïs*, he again found, in the
" *Oaſis* of *Honoreb*, the veſtiges of the canal of *Suez*, at its entrance into the cultivated and
" watered lands of *Lower Egypt*: having thus indiſputably aſcertained the two iſſues, he charged
" *Peyre*, engineer of bridges and highways, to take the level of it, beginning his operations at
" *Suez*." (See the *Précis des Evènemens Militaires*. No. IX, pages 213 and 214.)

* The project of the junction of the two ſeas, by the river *San Juan* and the lake of *Nicaragua* has preſented itſelf at all times to thoſe who have caſt an obſerving eye on the continent of *America*; and if the Spaniſh government have not attempted the execution of it, undoubtedly it is not becauſe they have not a knowledge of it of a date as old as their poſſeſſion of the country. Their attention muſt have been rouſed anew by the inſtructive Memoir which a French citizen, *Martin de la Baſtide*, publiſhed in 1791, under the title of *Mémoire ſur un Nouveau Paſſage de la Mer du Nord à la Mer du Sud (Paris Didot)*, and in which he has like an intelligent man, and with the zeal of conviction, diſcuſſed the poſſibility and the advantages of a communication between

And it may even be presumed that the labours which would be required by the direction of a canal, in order to effect, in this part, the junction of the two oceans that surround the two continents, would not surpass, would not equal perhaps, those which our RIQUET * executed so skilfully for crossing FRANCE by the canal that joins the MEDITERRANEAN to the ATLANTIC OCEAN; nor those which the Swedes have undertaken, for establishing an interior communication between GOTHENBURG and STOCKHOLM, between the CATTEGAT and the BALTIC; nor those which PETER THE GREAT and his successors have partly terminated, partly begun, for making a communication between the CASPIAN Sea, the BLACK Sea, the BALTIC, and the WHITE Sea: and the expense of these labours, for ever useful, would, no doubt, be inferior to that occasioned by a single war in EUROPE, which destroys by the sword a million of its inhabitants, and reduces a still greater number to wretchedness.

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between the two oceans. The Memoir was not favourably received by the cabinet of *Madrid*, and this might well be expected. Every man who takes an interest, from any motive whatever, in the facility and extension of navigation and commerce, must offer up prayers that the author of the advertisement, which precedes the memoir, may have rightly judged when he says, that "it is "impossible that *Spain* can longer resist the necessity of opening a communication between the two "seas; and that if her own interest be not capable of determining her, the instances of all "nations must end by compelling her to it." Let us accept the augury; but let us not wait for circumnavigating the globe, till the project be executed, otherwise we might be condemned never to circumnavigate it at all.

* Justice here demands from us a candid observation. *F. Andreossy* was the first who conceived the idea of the Canal of *Languedoc*, which was not only planned by him, but entirely completed under his immediate direction. He communicated his plan to *Riquet*, who presented it to the great *Colbert*, and, as soon as it had received the sanction of *Louis XIV*, became the contractor for all the works of that celebrated undertaking, which he did not live to see finished. However, in this, as in many other instances of the like nature, *Riquet*, not content with thence deriving every advantage of honours and emolument, greedily snatched from the original projector the meed of fame, so justly merited by the unremitting labour of thirty long years. Of the truth of these facts we have the proofs now before us, in a work entitled *Histoire du Canal du Midi*, recently published, and obligingly communicated to us by a friend of the author, General *Andreossy*.——

Translator.

But

But it is not Nature that would oppose the greatest obstacles to these enterprizes calculated to render the age illustrious, and do honour to the governments to which all nations should owe such a benefit. The obstacles, in the Old World, are connected with the difficulty, perhaps insurmountable, of carrying the canal that should communicate from the NILE to the RED SEA, across those unfortunate regions, alternately laid waste by despotism and anarchy, which are placed at too great a distance from the Sublime Porte, for the looks of a Sultan, if ever he look, to be able to reach them, and for the firmans of his Highness to be carried into execution; and in which we see the numerous chiefs who share, if not the property, at least the enjoyment of them, often in rebellion against the supreme authority, and always rivals among themselves, disputing with each other who shall impose the heaviest tax on the merchandise which, on the backs of camels, successively traverses the different districts that each of the oppressors, in his turn, causes to feel the weight of his avarice and tyranny *. In the New World, a different cause produces a similar effect: the suspicious policy of the power that possesses exclusively the mines of MEXICO and PERU will never allow the commerce of other nations to open itself a road through possessions, the knowledge of which it would wish to conceal from every eye: in those countries, the presence of a stranger is considered as a national peril.

If political disorder which reigns on the one hand, if uneasy jealousy which watches on the other, seem to refuse that our globe should be circumnavigated from east to west; Nature, on her side, has not chosen that it should be so from south to north, either in the ATLANTIC OCEAN between GREENLAND and LAPLAND; or in the GREAT BOREAL OCEAN, between AMERICA and

* The reader will readily perceive that the French were not in possession of Egypt when this passage was written.—*Translator.*

ASIA

Asia by Beering's Strait. Every one is acquainted with the fruitless attempts, begun upwards of three hundred years past, abandoned and resumed at different periods, to open, by the *north-east* and *north-west*, a passage whence it was supposed (which, however, is problematical, at least in regard to the north-east side) that ships might repair to China and the East Indies by a shorter route than that of the Cape of Good Hope or that of Cape Horn: but perpetual ice obstructs the seas which border on either pole; and all human industry, all efforts are unavailing against this obstacle.

Let us resolve then to traverse fourteen or fifteen hundred leagues, in order to sail round the world, since it has pleased the architect of worlds to give it only seven thousand two hundred leagues of circumference; we shall return to the project of shortening the route, if ever men, brought back to the principle of Nature, and considering themselves as one great family whose common habitation is our globe, at length consent to a community of territory, and to a universal and perpetual peace; but the philosopher who studies mankind, and meditates on their history, will not expect that this pleasing dream of the good Abbé de Saint-Pierre can ever be realized.

I shall not conclude this account of Captain Marchand's voyage, without paying to his memory the tribute of praise that is due to him, on more accounts than one, for his whole conduct in the expedition which he directed as a commander, and in which he was ably seconded by the intelligence and talents of Captains Masse and Chanal, by the zeal and activity of the rest of his officers, by the good-will, subordination, and diligence of all the seamen employed under his orders. Merchants and ship-owners would have reason to congratulate themselves, and might be easy as to the success of their undertakings, if the captains to whom they intrust their interests, acquitted themselves of their employment, like those belonging to the Solide, with the

vigilance which foreſees dangers without fearing them; the prudence which calculates and prevents accidents; the experience which knows how to repair them; and the perſeverance which ends by maſtering obſtacles: yet, unfortunately, it is but too common to ſee unſkilfulneſs and careleſneſs expoſe, at once, both the fortune of the employer and the ſafety of the crew.

The run of three thouſand five hundred leagues, which Captain MARCHAND made, in the ſpace of four months, from the Iſle of FRANCE to TOULON, without putting into any port on the route (for we cannot reckon ſuch a ſtay of thirty-ſix hours at ST. HELENA), is an example to preſent to our captains, who, for the moſt part, would think that they could not repair directly from INDIA, or the ISLE of FRANCE, to a port in EUROPE without touching at the Cape of GOOD HOPE, where the deſire of procuring a wine in high requeſt in FRANCE, the agreeableneſs of the place, the charms of ſociety, and the picture of plenty, detain them beyond the time required by the wants of the ſhip; without reflecting that, to ſtay in a foreign port, is to pay a voluntary tribute to the nation to which it belongs. I ſhall alſo quote to them the firſt run of four thouſand three hundred leagues, from MARSEILLES to the MARQUESAS DE MENDOÇA, the duration of which was ſix months, and in which the voyage was interrupted only by a ſtay of ſeventy hours in LA PRAYA Bay, in order to procure water and refreſhments.

Commanders leſs zealous might object that humanity dictates the neceſſity of often putting into port and allowing ſeamen frequent opportunities of repoſe; and that it is unavoidable, in the courſe of long runs, for the crew to eſcape the attacks of the ſcurvy, the progreſs of which it is ſo difficult to ſtop, when it has once found its way into a ſhip. I know that, in fact, the ancient navigators have had a melancholy experience of this; and that the wiſh, ſo natural to man, to endeavour to be acquainted with the different parts of the globe

which he inhabits, has coſt a great number of its inhabitants their lives; but I know too that, when in the age in which we live, we ſee a ſimilar calamity renewed, it can be attributed only to the careleſneſs of the captain who has neglected the preſervation of his companions of fortune, or to the avarice of the owner who has not ſupplied his ſhip with thoſe antiſcorbutics, at this day ſo well known, with thoſe efficacious preſervatives, the uſe of which Doctor PRINGLE in ENGLAND, and Doctor POISSONNIER in FRANCE, have introduced on board ſhips, with a ſucceſs which to them has been the moſt grateful as well as the moſt honourable reward for their zeal and reſearches. It is with theſe aids, that Captain COOK preſerved his crews in the longeſt runs, and in climates the moſt dreaded on account of the exceſs of the heat or the ſeverity of the cold; it is with theſe ſame means, that LA PÉROUSE, after two years of the moſt laborious navigation, did not reckon a ſingle ſick man on board the two frigates employed in his expedition *.

Nothing had been forgotten that could contribute to the well-being of the SOLIDE's crew, and deſtroy the germ of the diſorder peculiar to ſea-faring people: in this reſpect, juſt encomiums and thanks are due to the firm of BAUX, of MARSEILLES, who, after having conceived the project of the firſt expedition which the trade of FRANCE directed towards the NORTH-WEST coaſt of AMERICA, had employed themſelves with paternal ſolicitude in providing their ſhip with all the preſervatives calculated for protecting, from the deſtructive ſcourge of ſeamen, thoſe valuable men, who, after having bravely defended the flag of their nation againſt its enemies, devote themſelves during peace, to the profeſſion more perilous than lucrative, of enriching their country by commerce. The beneficent views of the houſe of BAUX were perfectly ſeconded by Surgeon ROBLET, of whom they had made

* *See* Vol. I. pages 21 and 22 what has been ſaid concerning the duration of theſe runs.

choice

choice to watch particularly over the health of the ſhip's company: he joined to all the theoretical and practical knowledge of his art, that ſentiment of humanity which renders a medical man ſkilful in making up for what he has not, in inventing means of relief, in creating remedies*, and in inſuring their

* I have thought that it would be uſeful for the information of the officers of health who devote themſelves to ſhare the fatigues of ſeamen, to give an account of the treatment which Surgeon *Roblet* introduced, and employed with the greateſt ſucceſs, for ſtopping in a man belonging to the crew, the progreſs of the ſcurvy, which, when the *Solide* quitted the *Sandwich* Iſlands, had manifeſted itſelf in this individual, with the moſt threatening ſymptoms, ſo much as to announce a very ſpeedy diſſolution: already, at the mere approach of land, three of his teeth had ſuddenly fallen out. The treatment of which he made uſe and which ſucceeded, conſiſts in the employment of the *ſand-bath*, dry and hot. The dry baths were known to the ancients, who employed ſand, ſalt, and millet-ſeed, *Cornelius Celſus*, of the *Cornelia* family, and phyſician to *Auguſtus*, has particularly treated of theſe ſorts of baths (*a*). In our days, they are known and employed, on the coaſt of *Africa*, and in the *Weſt India* colonies, for certain diſorders of the negroes, who are buried up to the neck in ſand which the ſun has ſtrongly heated. I have read in a manuſcript memoir of *Rollin*, Surgeon-Major of the *Bouſſole*, written in 1786, which, no doubt, will be printed at the end of the account of *La Pérouſe*'s voyage, that the Americans who inhabit the *north-weſt* coaſt, towards the latitude of 58° 40′, alſo employ ſand-baths as the moſt efficacious cure for the venereal complaint which is common on that coaſt. The action of the oblique rays of the ſun on the lands of *North America* not being ſufficient to give to the ſand the degree of heat neceſſary, and procure copious ſweats, they heat, by means of artificial fire, the ſand intended for the bath, as well as the pit dug to receive the patient, who, on coming out of the dry bath, waſhes himſelf in the ſea or in a neighbouring river. But, till now, we have not heard of this kind of bath having been made uſe of on board ſhip, for treating, at ſea, the ſeamen among whom the ſcurvy has attained its higheſt degree of malignity.

Surgeon *Roblet* wiſhing to try the effect of the dry bath on the ſcorbutic patient, nearly given over, as has been already mentioned, cauſed ſome ſand to be heated in a great boiler, and mixed with it a quantity of cold ſand ſufficient for moderating the heat of the former, and rendering it ſupportable. The patient was put into this bath, into which he ſunk to the middle of his thighs. The weather was dry and fine; and at noon *Réaumur*'s thermometer roſe to 25 degrees. The patient was left but half an hour in the ſand; his legs were at that time benumbed eſpecially the tendons of the extenſors, which Surgeon *Roblet* attributed to the irkſome poſition that he had kept. He made him lie down, recommending to him to keep himſelf ſufficiently covered not to experience

(*a*) *Sudor etiam* (ſays he) *duobus modis elicitur, aut ſicco calore, aut balneo: ſiccus calor eſt et arenæ calidæ, et laconici, et clibani, &c. Fomenta quoque calida* (adds he) *ſunt millium, ſal, arena; quodlibet eorum calefactum et in linteum conjectum, &c.* See *A. Cornelii Celſi Medicina Libri octo, ex recenſ. Leon Targæ*, &c. Lug. Bat. Luchtmans 1785. 4to. lib. II. parag.

their ſucceſs by a perſevering vigilance in obſerving their effects. He obtained the reward due to his talents, his active ſolicitude, and the conſtancy of his attention

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the action of the exterior air. After two hours' reſt, the condition in which he found the patient, ſeemed to border on a miracle; no more ſwelling; no more ſtiffneſs, even in the tendons; the ecchymoſes almoſt diſperſed, and become yellowiſh; the ſoles of the feet, before very painful, no longer cauſing any ſenſation; in ſhort, Surgeon *Roblet* had the ſatisfaction to ſee his experiment greatly exceed the hopes which he had conceived from it. A week's ſand-baths, the ſecond of one hour, and the others of two, were ſufficient for effecting the moſt complete cure: all the ſymptoms of ſcurvy diſappeared never to return; and the man who had been threatened with ſinking, in a few days, under the attacks of the diſorder, enjoyed, during the laſt ten months of the expedition, the moſt perfect health.

"It will be for experience," ſays Surgeon *Roblet*, "to make known the advantages which may "be derived from this treatment of ſcorbutic diſorders. Already every thing announces the greateſt "ſucceſs: and if it anſwer, in all ſubjects, to my expectation, I ſee nothing more eaſy and leſs "expenſive, than to provide every ſhip with an iron bathing-tub, with a double bottom, in which "can be introduced, without danger, the fire intended for drying and heating the ſand, and which "can contain the quantity ſufficient for covering the legs and even the loins of the patient. Com-"manders of ſhips will take care, beſides, to ſupply themſelves with three or four caſks of fine "ſand; and I think that that which has been waſhed by the ſea-water, ought to be preferred to "that of rivers, becauſe it contains ſaline particles, which are tonic. I am perſuaded," adds he, "that the uſe of the ſand-bath can be extended with advantage to the ſwelling of the legs, which "is the conſequence of chronic diſorders; to dropſies which are beginning, &c. &c."

The ſucceſsful trial which Surgeon *Roblet* made of theſe baths, in the treatment of a ſcorbutic patient in whom the diſorder appeared to have attained the moſt alarming period, will, I doubt not, induce officers of health employed on board ſhips, to make uſe of a curative method which a deciſive experiment, made by a good obſerver, muſt render worthy of imitation. But, at the ſame time, they will conſider it only as an *additional* curative; and they will not neglect to aſſociate to it, according as neceſſity ſhall indicate, thoſe which have been already adopted in the practice of phyſic, and of which experience has alſo conſecrated the uſe and proved the ſalutary effects: neither will they neglect the employment of the other aids which can exempt them from recurring to *curatives*; and ſurely they will judge that, to prevent the ſcurvy in long voyages, they ought to continue to employ the *preſervatives* whoſe efficacy is tried; ſuch as herbs and legumes pickled in vinegar, coffee, muſtard, wort, lemon robe, &c. &c. &c. as well as ſpirit of vitriol, mixed in a ſlight degree in the water that ſerves for the drink of the crew. My object is not here to recall to mind all the *preſervatives* known to profeſſional men; but in treating of this article, I muſt not forget to place at the head of the liſt, the moſt powerful, the moſt efficacious of all, exceſſive cleanlineſs: I ſay *exceſſive*, becauſe it muſt extend to the moſt minute particulars, and which might appear exaggerated, perhaps even ridiculous, to thoſe who, breathing all their life the pure air of our country-places or of our cities, are ignorant to what a degree the cleanlineſs of a ſhip and of the men

attention to the men with whoſe preſervation he had been intruſted. In the courſe of an expedition which laſted twenty months, in the midſt of fatigues and privations, after having traverſed every climate, and experienced every variation of temperature, the SOLIDE loſt only one man out of fifty who compoſed her crew; and this man died of a ſpecies of apoplexy: in the ordinary ſtate of ſociety, more than one individual in fifty dies in the ſpace of twenty months, ſuppoſing them to be thirty years of age, which is that we muſt reckon for the mean age of a ſhip's company*.

The preſervation of the people and the intereſt of the owners conſtantly ſhared the ſolicitude and care of Captain MARCHAND. The former object he accompliſhed, by the attention which he paid to the employment of every means that could contribute to maintain the good health of the companions of his labours; the latter he fulfilled, by employing himſelf aſſiduouſly, in concert with Captain CHANAL, in aſtronomical obſervations, which, by rectifying the errors unavoidable in the dead reckoning, gave him the advantage of being able to ſhorten his runs, and the confidence of making the land with ſafety and preciſion at all the places at which he propoſed to touch. Each of his land-falls may be quoted as a proof of the correctneſs of his opera-

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men on board, aſperſions of vinegar, fumigations, perfumes, ventilators, &c. are neceſſary, for maintaining in this floating houſe, at once, a ſtoreroom of corruptible proviſions, a pig-ſtye, ſheep-pen, poultry-yard, and hoſpital, an air that is not mephitical, and does not carry with it a cauſe ever preſent, ever acting, of diſeaſe and deſtruction It would be ſuperfluous, no doubt, to recommend to ſeamen, to add to the *preſervatives* and *curatives*, the uſe of legumes, herbs, fiſh, meats, and other freſh proviſions, whenever the opportunity, always wiſhed for, preſents itſelf of procuring them for the conſumption of the crew.

* It is proved, from the calculation of the probabilities of human life, founded on inquiries the moſt numerous and the moſt exact, that, out of five hundred individuals whoſe mean age is thirty, fifteen die in the ſpace of twenty months: in following this proportion, out of fifty individuals of the ſame age, there muſt die, in the ſame ſpace of time, at leaſt one, and perhaps two, ſince the calculation gives one and a half. (Note communicated by Citizen *Duvillard*, aſſociated member of the National Inſtitute of Arts and Sciences.)

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tions, at the ſame time that, in order to determine the longitude, there is a neceſſity for making uſe of thoſe means ſo long wiſhed for, ſo long expected, of thoſe new and invaluable methods, to which a further degree of preciſion is added by the concurrence of two obſervers, whoſe obſervations and calculations reciprocally control and rectify each other.

It may excite aſtoniſhment, that, in concluding, I ſhould recur to a remark, which, at different periods of the voyage, I have taken care to bring forward; and, undoubtedly, there is no one who is not perſuaded that ſeamen have been eager to promote and employ methods, the advantage of which is manifeſt, and which are reſults ſet within their reach, theories the moſt ſublime and combinations the moſt ingenious. I would wiſh to have praiſes only to beſtow; and it is painful, for a *Veteran of the Navy*, to have reproaches to make to thoſe who are engaged in the profeſſion; but I ſhould merit them myſelf, if a culpable reſerve induced me to keep ſilence. It is time to rouſe French navigators from the humiliating apathy which keeps them in the ſhackles of an old *routine*, and prevents them from turning to account, for the ſucceſs of the enterpriſes that are intruſted to them, and for their own ſafety, the diſcoveries, which, for half a century paſt, geometry, aſtronomy, and mechanics, rivals in ſucceſs as in labours, have added to the domain of the ſciences, and the only object of all which is to inſure and abridge the route of the navigator. Will it be believed that FRANCE does not reckon a hundred ſeamen (and I might reduce the number to much below the half) who know how to employ at ſea, the obſervation of the moon's diſtance from the ſun or ſtars; to make uſe of the machines proper for keeping, as in truſt, the time of the place from which the departure is taken; and deduce, from either method, or from the two combined together, under what meridian, on a given day, the ſhip is arrived? What avails it that the Board of Longitude of FRANCE, like that of ENGLAND, calculates with all the preciſion required

for the perfection of these great theories, the auxiliary tables which facilitate and abridge the calculation of the observations; and that these tables, consecrated, for the most part, to the use of our navigators, are published, for every year, several years in advance, in order that ships intended for distant expeditions, may, on their departure from EUROPE, be provided with them for the whole duration of the longest voyages? What avails it that FERDINAND BERTHOUD, by opening to the French artists a new career, by creating, for the navy, an art of clock-making, which may be called *transcendent*, has found means to combine the most finished execution with the most subtle theory*, and that LOUIS BERTHOUD, treading in the steps of FERDINAND, has, for the use of seamen, multiplied those ingenious machines, master-pieces of mechanism, with which they can daily, and several times a day, solve the problem of the longitude at sea, and, in a little time, correct or improve all hydrography? What avails it that BORDA has presented to the French navy, for observing at sea the altitudes and distances of the luminaries, an instrument which the smallness of its bulk renders as portable, as convenient for use, as the excellence of its principles renders it certain and exact in its results? What avails it, in short, that he and our geometricians have applied themselves to, and succeeded in, finding methods of simplification, by the help of which the business of computation that remains for the seaman

* This artist, Member of the National Institute of Arts and Sciences, no less commendable from his disinterestedness than from the fecundity of his genius, has published, without reserve, at different periods, the results of his numerous researches and immense labours respecting machines calculated for measuring time, and those the special purpose of which is to determine the longitude at sea. In order to make the reader sensible of all the importance of this publication, it will be sufficient to say, that an artist, named *Armand*, constructed at *Copenhagen*, without any other assistance than the works of *Ferdinand Berthoud*, and the plates which he has annexed to them, time-pieces, of which M. *de Löwenörn*, Captain in the Danish Navy, a great proficient in astronomy, made use with success for finding the longitude at sea. (See *Observationes Astron. institutæ in Observatorio Regio Hauniensi, &c. Auctore Thoma Bugge, &c. Hauniæ*, 1784. *Typis Aulæ Regiæ* 4to. page XCVIII.)

to perform, after his obſervations for the longitude, becomes, as it were, only a manual operation, which requires no knowledge of the theories, which neither ſubjects him to a calculation more long nor more difficult than that which he daily impoſed on himſelf, to learn by a coarſe approximation the actual poſition of his ſhip, and to attain, by a lame proceſs, an erroneous reſult? In the period at which we are arrived, the arts and ſciences have left to the ſeaman to perform, for the purpoſe of regulating his navigation, only what it was not poſſible to do beforehand, in order to ſave him the labour of it. And the ſeaman remains inſenſible before theſe productions of genius, of which he was the object! And the admiration with which they ought to inſpire him, can neither excite his zeal nor his vanity, nor awaken in him the ſentiment of his intereſt! And the men of ſcience and the artiſts, who have devoted themſelves with equal ſucceſs and ardour, to theſe laborious reſearches, are ſtill to expect the only reward that they had annexed to their labours, the ſatisfaction of ſeeing that thoſe to whom they were conſecrated, ſhould haſten to gather the fruits of them!

It is time that, in this reſpect, our humiliation ſhould ceaſe: the reign of ignorance is long ſince paſſed for ſeamen; it is no longer enough for them to be brave warriors, intrepid navigators; their honour, the national honour impoſe on them the obligation of knowing that of which it is no longer pardonable for them to be ignorant. If it were requiſite for Frenchmen to be ſtimulated by the example of a rival nation, I ſhould ſay to our navigators, that there is not a ſingle Engliſh captain, employed in long voyages, who does not at this day make uſe of the new methods for determining the longitude of his ſhip; I ſhould ſay to them that it is with this help, that the navigation of our enemies boldly embraces the two hemiſpheres; and that every point of the globe at which an Engliſh ſhip touches, now acquires a determined ſituation with reſpect to the other points of the earth, which ten centuries of

a navigation of routine would never have ſucceeded in fixing. In ſpeaking to ſeamen, I ſhall not add to views of general utility, the particular motive of their own preſervation; I know too well that, from principle and habit, they deſpiſe danger; I know that, in the height of a ſtorm, when the ſea threatens to ſwallow them up, at the ſight of the ſhoal againſt which the plank that ſeparates them from the briny abyſs may be ſplit in pieces, wholly occupied with the ſafety of the ſhip intruſted to their charge, one thought alone of the future can be aſſociated in their mind with the rapid combinations which require the preſent effort of all their faculties: *Hæc olim meminiſſe juvabit*; they love to prepare for themſelves recollections. But let them learn to be ſatisfied with the conflicts which the revolted elements ceaſe not to wage with the navigator who wiſhes to conquer them: let their indifference not make them diſdain the helps that are offered for reſcuing them from the dangers which it is poſſible to avoid, which it is not glorious to brave: what! will not adverſe fortune always reſerve to herſelf too many for exerciſing nobly the courage of our Argonauts, and filling the page of naval hiſtory with the account of thoſe terrible events, which inſure to the ſuperior genius who maſters them, the applauſe of the preſent age, and a long remembrance in ages to come?

Paris the 20th Germinal, year V. of French era.
(April 9th, 1797.)

P. S. Captain CHANAL's journal, having cloſed on the arrival of the SOLIDE in the harbour of TOULON, could not give an account of the ſucceſs of the expedition as a commercial ſpeculation; but ſome notes ſubſequently communicated to me by the firm of BAUX, have made known the final reſult of the adventure. The plan had been perfectly well conceived; and if the prohibition iſſued at CHINA, which could not be foreſeen, had not thwarted it in the outſet, the ſhip ſheathed with copper, and copper-faſtened, built and equipped,

equipped, in every reſpect, for keeping the ſea for three or four years, without needing any other repairs than thoſe which accidents might neceſſitate, provided with four complete ſuits of ſails and four ſets of rigging, with an immenſe ſtock of proviſions, and an aſſortment of articles for trade ſufficient for a long ſeries of operations *, might, after her firſt touching at MACAO at the end of eight months, have eaſily undertaken, before her return to FRANCE, two more voyages from CHINA to the coaſt of AMERICA: and our navigators would have had the certainty of getting the ſtart, at both places, of all the veſſels that might have been diſpatched, either from EUROPE, or from the UNITED STATES, and of having for competitors none but thoſe which, ſailing from the Ports of ASIA, might have been engaged in a ſimilar ſcheme. On her third voyage to CANTON, they would have converted into teas, ſilks, and the other productions of CHINA, the whole of the produce of her three trips: and it is impoſſible to eſtimate to what ſum

* The houſe of *Baux*, wiſhing to be certain that all the works of our manufactories which they intended to be employed in traffic with the Americans of the *north-weſt* coaſt, ſhould be well-conditioned and of the firſt quality, thought that they could do no better than intruſt the houſe of *Guilliaud* father and ſon, Manufacturers at *St. Etienne*, trading to *Lyons*, and holders of a ſhare in the *Solide*'s expedition, with the fabrication of all the articles of hard-ware, arms for the ſavages, tools, and different implements, which the experience of preceding voyages had indicated as proper to be admitted with moſt facility and advantage in the fur-trade. The houſe of *Guilliaud*, in executing this commiſſion, exerted all the intelligence of very well-informed and enlightened merchants, and all the zeal with which they were inſpired by the importance of the expedition, the object of which was known to them. But a conſiderable demand for halberts and other offenſive arms, the fabrication of which employed ſeveral workſhops ſcattered through the country, could not but throw an alarm among ignorant, ſuſpicious, and reſtleſs men, whom liberty had juſt ſuddenly armed, and who thought they ſaw, in this collection of arms, counter-revolutionary preparatives and means. It was not without infinite pains on the part of the houſe of *Guilliaud*, nor without repeated danger to their perſons, that after ſeven or eight months oppoſition on the one hand, and perſeverance on the other, the municipalities of *Lyons*, *St. Chamont*, and *St. Etienne*, to whom the object and the deſtination of the arms were perfectly known, and who wiſhed to ſee them diſpatched, at length ſucceeded in calming the agitated minds of theſe men; and, with the ſupport of a corps of twelve hundred men which was paſſing through *St. Chamont*, ſent off from this commune and directed towards *Marſeilles*, thoſe terrible halberts, of the kind uſed by our pariſh-beadles, the ſight alone of which had ſpread alarm in the town and its environs.

might have amounted the joint profit of theſe combined operations. Fortune ordained otherwiſe: the produce of the firſt trip not having been able to find vent, Captain MARCHAND gave up all thought of a ſecond; every farther operation was neceſſarily ſtopped; and as a ſole and wretched reſource, the cargo of furs was brought to FRANCE. It was immediately ſent to LYONS, where the commercial concerns of the place, and the favourable ſeaſon might promiſe no inconſiderable advantages in the ſale; but it arrived there only a few days before the period when that unfortunate city, torn by civil war, experienced all the horrors of a long ſiege: in the midſt of fire and devaſtation, the furs belonging to the houſe of BAUX were ſeized; and, being forgotten under the ſeals, notwithſtanding their remonſtrances, which were rendered more urgent by the danger of delay, they became a prey to the worms. But the owners of the SOLIDE, no leſs zealous for the proſperity of their country, than diſintereſted in their ſpeculation, will think themſelves indemnified for the loſs of two-thirds of their capital, if the new path which they have opened to French merchants, who, no doubt, will take care to engage in it with prudence, and meaſure their operations by probabilities, can one day procure an additional outlet for the national induſtry; and, for the State, a mean of forming, in thoſe long voyages which exerciſe courage and ripen talent, ſeamen who join to the intrepidity that braves dangers, the experience that teaches to avoid them.

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
PARTS OF THE HUMAN BODY.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
A Man	.....	.....	T*ee*te	Teète.
A Woman	.....	.....	Ve'h*ee*né...	Vahèine.
The act of intimate union of the Sexes	Ouka-houka.	Ouka-Ouka.		
The Head	.....	é-Houpoco.	.....	Oòpo.
The Hair	.....	é-Houhoho.	.....	Oòwho.
The Forehead	Haë *.			
The Eyebrows ...	Toukéhaë *.			
The Eyes	Matta.	Mata.....	'Matta *or* Matta*eea*.	Mattà.
The Nose	Hōni *(c)* .. Hihou *(M)*	é Hihou...	.....	Eiyoo.
The Mouth	Noutou....	é-Noutou..	.....	Mòtoo.
The Tongue	Aëio.....	é-Aheho.		
The Teeth	Niōh.....	é-Niho....	E'n*ee*ho.	
The Chin	Cohoūhahi	é-Cohouhaï.		
The Beard, a Beard	.....	.. ..	.....	Oòmee.
The Ears	Pouhāhîna	Bohouahina.	.....	Poneenohòe.
The Neck	Hokaki ...	é-Kaqui.		
The Body or *the Shape*	Ehouma**.	é-Houma.		
The Neck or *Breast*	Houma **..	é-Houma.		
The Breasts	Hōu.....	é-Hou.		

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
PARTS OF THE HUMAN BODY.	CHANAL.	ROBLET.	COOK.	R. FORSTER
The Arms	Mataïo *(c)* . e-Hima *(M)*	é-Ima.		
The Elbows	Touka-hima** ..	é-Touca-hima.		
The Hands	Mana, Ma-naïna....	é-Mana, Mana....	Eoomy.....	Heèma....
The Nails	Mattécou *(c)* Mayouhou *(M)*	é-Mayou-hou.		
The Belly	Poppou....	é-Coppou..	....	Òpoo.
The Navel	Pito.....	.....	*Pee*to *or Pee*-to'ai.	
The sexual Parts of Woman	Hōmo.....	é-Homo.		
The genital Member	Titoï.....	é-Houhou. Titohi.		
The Genitals	Comaï** ..	é-Comaï.		
The Buttocks	Poutétou-tahi **. ..	é-Poutétou-lahé.		
The Anus	Ouakého **.	é-Houha-kého.		
The Thighs	Pouhâ.....	é-Pouha.		
The Knees	Mouhô....			
The Legs	Mahivahé..	é-Vahï-Vahi.		

The

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
PARTS OF THE HUMAN BOBY.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
The Feet	Tapouvahé .	Tapou-Vahé.	.....	Awāi.
The Heels.....	Oukévahi* .			
DRESSES, ORNAMENTS, &c.				
Any Cloth whatever, Handkerchief, Cloak, or *other Garment* ..	Kahou.....	é-Cahou.	'Ah*oo*, *or* 'Ah*ooeea*.	
Hat or *Ornament for the Head*...	Béhouhaï**	é-Béhouhaï.		
Glaſs-Beads.....	Pippi.....	Pippi.		
Punctures or *Tattooing*.....	Tâtou.....	.....	E'pat*oo*.	
Looking-glaſs	Ouhatta.			
ARMS, TOOLS, IMPLEMENTS, &c.				
Pike.....	Tôto *(c)*. é-Cahahou *(M)*.			
Sabre, dagger, ſword.....	Pahouha *(c)* Cohé *(M)*..	é-Cohé.		
Lance (the ſame word is uſed for a *Muſket with the Bayonet fixed.)*	.....	Cahahou.		

Cannot

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
ARMS, TOOLS, IMPLEMENTS, &c.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
Cannon, or *any fire-arms whatever*.	Pouhi.....	Pouhi.		
Sharp-edged Tools, and *Shells employed for the same use*.....	.....	é-Ouhi.		
Stone with which their Tools are tipped.....	Tôki **...	Toki.		
Whet-stone.....	Pounah **..	Pouh-nah.		
Hatchet.....	.....	.....	.....	Tòèe.
Nail.....	Pappâh....	Pappa.		
Fish-hook.....	Éppâh.....	é-Pah.		
House, Cabin....	.....	.....	.....	te-Whärre.
Canoe.....	Évakâh ...	é-Vaka....	E'väa.....	Whää.
European Ship or *Boat*.....	Hapaï *.			
ANIMALS, TREES, PLANTS, &c.				
Hog.....	Bouhaka... / Pouhaka...	Boha *or* Boaka.	'Booa.....	Boòhä.
Name which the Natives gave to a Cat.....	Pouhîhô.			
Cock or *Hen*.....	Môha.....	é-Moha...	Möa.	

Fish

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
ANIMALS, TREES, PLANTS, &c.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
Fish	Éatou *(c)*.. é-Hika *(M)*	é-Hika	.....	Eèiyā.
Shell-fish	Pouhé **...	Pouhé.		
Bread-fruit	Mâhië	Maïhi	*Maiee*	Oòroo, Màee.
Cocoa-nut	Aéhie	é-Ahéhi	.....	Neèoo.
Plantain	.....	.....	*Maiee* a	Māiā.
Sugar-cane	Nohou **..	é-Nohou.		
REMARKABLE OBJECTS.				
The Sun	é-Ahou, *or* Notéani *(c)*. é-Ha *(M)*..	é-Ha.		
The Moon	.....	Oumati.		
The Sky, and perhaps the *Stars*	Tohoua *(c)* é-Hani *(M)*	é-Hani.		
The Ground, the Soil	.....	.....	.....	Whennòoā.
The Sea	Étahi *	é-Tahi.		
Water	Évahi	é-Vahi	.....	Evai.
Rain	Issâh.			
TITLES, &c.				
Chief	Otohou, Otou	Othoou, Othou,	.....	A-ka-ài.

Friend

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
TITLES, &c.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
	Title given to Captain Marchand *by the Natives.*			
Friend or *Friends*.	Täyo *and* Täyé.	Tayo *or* Taïïo.		
Handſome, very handſome	Maï, Daï *.			
Small.	. . . . .	. . . . .	. . . . .	Èetee.
I, me.	. . . . .	. . . . .	'W*ou*.	
Thou, thee, you . .	. . . . .	. . . . .	Oë.	
VARIOUS EXPRESSIONS.				
Come, approach . .	Haëo **. . .	Hahého.		
Come with me, follow me	Mâhi ** . . .	Mahi.		
Go, go about your buſineſs	Tahi ** . . .	Tahi.		
Wait, preſently, directly	Heppo	e-Poh.		
Do you conſent ? . .	Eh ? *(very open)* * . .			
Silence, hold your tongue !	Moutton *.			
To *kill*, and alſo *killed, dead* or merely wounded.	Matté	Matté.		

A thing

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
VARIOUS EXPRESSIONS.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
A thing prohibited.	Tâbou			
To drink.	.....	.....	'A*ee*n*oo*	Àinoo.
NUMERICAL TERMS *.				
One.	a-Tāhi	Tahi.....	Atta'ha*ee*. ..	bo-dāhāì.
Two	a-Houāh ..	Houah	A'*oo*a.....	bo-hoòā.
Three	a-Tōhou ..	Tohou .. .	A'tor*oo*	bo-dò-oo.
Four	a-Fāh.	Fah	A'faa.....	bo-hā.
Five	a-Hima....	Hima.	A'*ee*ma	bo-heèmā.
Six.....	a-Hōno....	Hono	A'ono.	bo-nā.
Seven.....	a-Fitto	Fitou	A'wh*ee*t*oo* ..	bo-hìddoo.
Eight.....	a-Vāho	Vahou.	A'wa*oo*	bo-wàhoo.
Nine	a-Hīva....	Hiva.....	A'*ee*va.....	bo-heèvā.
Ten.	a-Onohō-hou.	Onohouhou.	'Wannah*oo*, *or* Wan-na'h*oo*e ..	bo-nahoo.
NAMES OF THE ISLANDS.				
San-Pedro	ô-Niteïo. ..	Onétéyo ...	.....	O-Nateya.
La Dominica	ô-Hivahöa.	Ohivahoa ..	.....	Heeva-roa.

* They have no numerical terms beyond TEN; but, as they reckon the Tens with their fingers, they can count as far as a HUNDRED.

ENGLISH WORDS.	CORRESPONDING WORDS IN THE LANGUAGE OF WAHITAHÔ.			
	FRENCH PRONUNCIATION.		ENGLISH PRONUNCIATION.	
NAMES OF THE ISLANDS.	CHANAL.	ROBLET.	COOK.	R. FORSTER.
Santa - Christina (or perhaps the name of the Bay of *la Madre de Dios.*) . . .	Wahîtahô. .	e-Vaïtahou .	. . . . .	Waitahoo.
First Bay to the southward of *la Madre de Dios**.	a-Nâpôho. .			
Second Bay. *South Cove.*	a-Pâtôni. . .			
Second Bay. *North Cove.*	a-Nâlévâho.			
La Madalena. . . .	It is not known what names the Natives give them.			
Hood's Island. . . .				

* I rather think that this is the name of the island itself, because it was laid down on *Tupia's* Chart. See pages 170 and 171 of Vol. I.

VOCABULARY

VOCABULARY

OF

WAHITAHÔ,

(OR MENDAÑA'S SANTA CHRISTINA),

ONE OF THE ISLANDS OF

THE ARCHIPELAGO OF LAS MARQUESAS DE MENDOÇA.

I HAVE thought that it would be uſeful to preſent, in a comparative table, the Vocabulary which Captain COOK has given us, that for which we are indebted to JOHN REINHOLD FORSTER, and thoſe which Captain CHANAL and Surgeon ROBLET have ſeverally compiled.

The reader will remark, in the words which are common to the four vocabularies, the differences that partly depend on the different manner in which they were heard, and ſtill more on the different manner in which they were written in order to fix their pronunciation. I have deemed it expedient to preſerve them ſuch as each voyager has repreſented them, with the articles and the other ſigns that he has employed for indicating the ſounds which he means ſhould be emitted in pronouncing them.

The vocabulary of Captain COOK is taken from the Table of compariſon of the languages of the iſlands of the GREAT OCEAN, which he has given us in the ſecond volume of his ſecond voyage, *page* 364.

He

He apprizes us that the double vowels in italics, *oo*, *ee*, are to be ſounded as one: for the French, *oo* repreſent the diphthong *ou*, and *ee*, the long vowel *î*.

The *diæreſis* vowels, that is to ſay, accented with two points, are to be pronounced ſeparately: thus, in *öe* Engliſh, which is *öi* for the French pronunciation, each of the vowels is to form a ſyllable.

The accent placed *before* the word indicates that the chief ſtreſs in pronunciation is to be laid on the firſt letter or ſyllable of the word; but if the accent be *over* the firſt letter, or *over* another letter in the courſe of a word, the ſtreſs is to be laid on the ſyllable which immediately follows the accent.

A *comma* (or what, from its form, we ſhould call an acute accent), placed in the middle of a word, either ſignifies that it is compounded of two words, or that the ſame ſyllable repeated forms the word: in both caſes, a ſmall pauſe is to be made in the place indicated by the *comma* (or accent.)

A Frenchman who wiſhes to pronounce, ſo as to be underſtood by a Mendoçan, the names written in Cook's vocabulary, muſt obſerve that *A* Engliſh there anſwers to *A* French—*AI* to *È*—*E* to *Î*—*O* to *O*—*OO* to *OU* diphthong—*OU* to *ÄOU*—*Y* to *AI*.

Reinhold Forster has employed, in his vocabulary, accents and other ſigns placed over the letters in order to ſignify how he wiſhes they ſhould be pronounced; but he gives no explanation of theſe ſigns. I have preſerved them as they are ſeen in the original, without chooſing to venture to explain them: I think, however, that, by the aſſiſtance of what is ſaid in regard to Cook's vocabulary, Forster's intention may be divined *.

* See *I. R. Forſter's Obſervations*, &c. page 284.

Captain

Captain CHANAL has made uſe of the ſign of the Latin proſody, which indicates that the ſyllable, over which it is placed, is long: he has, beſides, given to the acute accent, to the circumflex accent, and to the *diæreſis* of the French orthography, their ordinary function with which every one is acquainted. The words of his vocabulary are to be pronounced as if they were written in French, and all the *H*'s are to be aſpirated.

Moſt of the words, which he has there inſerted, were collected ſeparately by Captain MARCHAND and himſelf: the words reſpecting which they have agreed (and this is the greater number) bear no mark; but thoſe concerning which they have differed, are written in the two ways in which they heard them; and each word is followed by the initial letter of the name of the obſerver: thoſe which are marked with a * were collected by Captain CHANAL, and thoſe accompanied by **, by Captain MARCHAND.

The vocabulary of Surgeon ROBLET is accented for the French pronunciation, and muſt be read as if the words were French, but all the *H*'s muſt be aſpirated.

It muſt be obſerved, that the Mendoçans, in ſpeaking, moſt commonly place an *A* or an *E*, and ſometimes, but more rarely, an *O*, at the beginning of a word; frequently too they ſuppreſs it: theſe vowels, thus employed, appear to perform the office of an article; and it is a cuſtom rather general in all the languages ſpoken by the natives of the iſlands of the GREAT OCEAN, to place before words, and particularly proper names, ſome one of the three vowels, *A*, *E*, *O*: thus in the name O-TAHEITEE, one of the SOCIETY ISLANDS, *O* is the article, and TAHEITEE the name of the iſland, &c.

It may be conceived from the Vocabulary, although ſo extremely conciſe, of the language of the Iſland of WAHITAHÔ, that the Mendoçans employ no difficult articulation, and that their language, notwithſtanding the frequent aſpirations, and the vehemence with which they are accuſtomed to expreſs themſelves, poſſeſſes ſweetneſs and a ſort of harmony.

See Vol. I. pages 138 to 141.

VOCABULARY

VOCABULARY

OF

TCHINKI TÂNAY,

ON THE NORTH-WEST COAST OF AMERICA, *IN THE LATITUDE OF 57 DEGREES NORTH.*

ALTHOUGH the Vocabulary, compiled by Surgeon ROBLET, differs very little from that drawn up by Captain CHANAL, it is not altogether uſeleſs to make them both known: every obſerver has his manner of writing words, and that depends on the manner in which he heard them.

Captain CHANAL, in order to indicate the *quantity* of ſome ſyllables, which are long, has placed above thoſe ſyllables the indicative ſign of the Latin proſody: "the others," ſays he, "are, for the moſt part, ſhort; and ſome are "doubtful. The *G* and the *K*, preceded or followed by an *L*, are pro-"nounced with a trill, which cannot be expreſſed by any ſign of French "writing, and which it is impoſſible even to imitate, if the organ of ſpeech "have not been formed to it from infancy. The ſyllables *cha*, *chi*, have been "repreſented by *tcha*, *tchi*, becauſe they are to be pronounced as the Italians "pronouce *ce*, *ci*, that is to ſay, *tche*, *tchi*." Captain CHANAL alſo informs us that the words which are marked with a * were communicated to him by Surgeon ROBLET.

 The

The latter obſerver, on his part, informs us, that the words whoſe *quantity* he has not marked by the ſigns ¯ or ˘ of the Latin proſody, either were not collected by himſelf, or were pronounced before him, by different inhabitants of the country, ſo that he had it not in his power to repreſent the pronunciation of them with the ſame certainty as he has done in regard to the words whoſe *quantity* he has marked. "In general," ſays he, "the na-
"tives of TCHINKITÂNAY have a very guttural pronunciation, making on
"the *G* a little trill, which cannot be expreſſed in our language. I have
"endeavoured to repreſent their pronunciation of the *C*, which is the *tche* of
"the Italians, but the *T* of which is conveyed to the ear in an almoſt imper-
"ceptible manner. It will be conceived, from the ſmall number of words
"that I have been able to collect, and from the varied acceptations which
"the inhabitants give to them, that the language of TCHINKITÂNAY is very
"copious."

See Vol. I. towards the end of Chapter IV.

N. B. Sound all the letters in both vocabularies; pronounce *in* final, or *in* at the beginning or in the middle of a word, as if they were written *inn*, or *ine* terminated by an *e* mute.

ENGLISH WORDS.	CORRESPONDING TCHINKITÂNAYAN WORDS.	
PARTS OF THE HUMAN BODY.	ACCORDING TO CHANAL.	ACCORDING TO ROBLET.
The Hair	Satkāg-hoū	Kā chă kă oū.
The Forehead	Kākac	Kā kăc.
The Eyebrows	Kātſéré	Kătſỹ *and* Kĕ te ſe rĕ.
The Eyelids	Kaoūktāki	Kaout-taki.
The Eyes	Kāoūtſtākitſi	Kă hoū hăc.
The Noſe	Kātſloūkoutſch	Kă chĕ loŭ.
The Septum of the Noſe	.....	Kăs loŭ tchī.
The Whiſkers	.....	Kăkătălchă ā̄gnĭ.
The Mouth	Katkāſka	Kat kas ka.
The Lips	Kākraigz*	Kă kraĭgz.
The Teeth	Kāhoū	Kā hoŭrḡ.
The Tongue	Kātſlout	Kats loug.
The Chin	Kātty	Kă tĭ.
The Beard	Katktātāhi.	
The Ears	Kākouk	Kĕ koŭ qŭe *and* Kag houg.
The Neck	Katſlāta	Kaſt la ta.
The Gullet	.....	Kā chāi kăt choū coū.
The Breaſt	Kākitt.	
The Breaſts	Kātſla	Kăt chē lă.
The Shoulders and the Arms	.....	Kă rĭ gŭe.
The Shoulder	Kākig	Kă oŭ coŭ.
The Arm	Kāſſy.	
The Fore-arm	Kātchin	Kă tĭs ſcĭ ſcoŭ.
The Hand and the Fingers	.....	Klăt hēr gŭe.

The

ENGLISH WORDS.	CORRESPONDING TCHINKITÂNAYAN WORDS.	
PARTS OF THE HUMAN BODY.	ACCORDING TO CHANAL.	ACCORDING TO ROBLET.
The Hand	Kātchicou.	
The Fingers	Kātleck.	
The Fist	.....	Kă thcĭ koūlliă.
The back of the Hand	.....	Ka tchou tine.
The Nails	Kahākin	Kă rā koū.
The Arm-pits	Kāhīnié	Ka hi ny.
The Ribs	Kātſloug	Katſlong.
The Stomach	Kaghoūgā *	Kăghougā.
The Belly	Kājoū *	Kā joū.
The Navel	Kāhoūtſt.	
The natural Parts of Man	Kātgligz	Kăt ğlĭgz *or* Kăt lĭchē.
Ditto of Woman	.....	Kōuğz.
Hair of the Os Pubis	Koūgza *	Ko gſă.
The Posteriors (in general)	Kaguéhaï *	Kă gue haÿ.
The Buttocks	Katoukotchi	Ka tou kot chi.
The Thighs	Kakatch	Kă gătz.
The Knees	Kakiſſakanoūkoū	Ka kiſſa ka nou kou.
The Legs	Katſéyouhā	Kăt ſeĭ joŭ.
The Feet	Kayēſtkā	Kă goū ſătz ğli *and* Kahieſtka.
The Ancle-bones	Katchoūtouk	Ka tchou touk.
The Soles of the Feet	Kakouſtak	Ka kous tou.
Tattooing (punctures or marks on the Skin)	Kotēhkl	Kets chle.
Lip-ornament	.....	Keīn tă kă.

A male

ENGLISH WORDS.	CORRESPONDING TCHINKITÂNAYAN WORDS.	
PARTS OF THE HUMAN BODY.	ACCORDING TO CHANAL.	ACCORDING TO ROBLET.
A male Child	Kéſāny*	Kĕ ſā nī.
The Son (with reſpect to the Father)	Kāguit	
A female Child	Saguéſāny	Să guĕ ſā nī.
NATURAL OBJECTS.		
The Sky	Coūtc̄hs.	
Fire		Kră nĕ.
Freſh water	Hīll	Hill.
A Dog	Kēkle	Keīt tĕ.
A Fiſh	Tſchāāts	Tc̄haſſĕ.
An Ant		Kă ſeīs tĕne.
A Muſkito	Tāk-hā	Tak ha.
Trees ſtanding (Foreſt)	Aāā	Aſs.
A Tree cut down, felled		Kră goŭ.
A Flower by its generic name, or a Flower by its particular name	Youhātſkoutq	You hats kou.
Stones	Tēē	Tehée.
WORKS OF THEIR OWN HANDS, &c.		
Hut or Tent		Keĭte.
Canoe	Yācou	Ya cou.
Cheſt (of their own make)	Koūk	Ka ouk.
Fiſhing-rod or *Line.*	Tchakāā	Tcha kaa.

ENGLISH WORDS.	CORRESPONDING TCHINKITÂNAYAN WORDS.	
WORKS OF THEIR OWN HANDS, &c.	ACCORDING TO CHANAL.	ACCORDING TO ROBLET.
A Joiner's Plane or *Chisel mounted to serve as a Hatchet.*	Krōta.....	Kro ta.
The helve of a Hatchet.....	Assōcti.	
A Fur-Cloak, and skins serving as clothing.....	Koūn (Cloak).....	Kā koŭ oū *(Skins)*
A Hat.....	Tsaūhou.....	Thau sou.
A Jacket.....	Koūtēsk*.....	Kou tesk.
Coat Buttons.....	Kāhīcoutz.....	Kaï kouts.
A Ring.....	Klectākiks.....	Klettaki.
A Present.....	Stock.	
Proper name of the Bay called, by the Spaniards, BAYA DE GUADALUPA, *and* NORFOLK SOUND *by* DIXON.	TCHINKĪTĀNÉ.....	TCHINE KITANÉ.
Exclamation, expressing consent or satisfaction.....	Ouōh!	
NUMERICAL TERMS.		
One.....	Clĕrrg.....	Kaike.
Two.....	Tērrk.....	Tĕrg.
Three.....	Nōtchk.....	Netx̄.

* The word *Kotēsk* likewise signifies a Jacket or Waistcoat at *Queen-Charlotte's* Islands *(See* Vol. I. Chapter V.

ENGLISH WORDS.	CORRESPONDING TCHINKITÂNAYAN WORDS.	
NUMERICAL TERMS.	ACCORDING TO CHANAL.	ACCORDING TO ROBLET.
Four	Tācoun	Tacoŭng.
Five	Kītchin	Ke't tchĭnē.
Six	Klétoūſchou	Keī toŭ choŭ.
Seven	Tākrratoūſchou	Tră toŭ choŭ.
Eight	Nétſkatoūſchou	Neīx că toŭ choŭ.
Nine	Kouūſchok	Koŭ chāc koū.
Ten	Tchīnkat ——	Tchìne kăte.
Twenty	Clērr-kat.	
Forty	Tērr-kat.	

See the manner of counting of the Tchinkitânay-ans, towards the end of Chap. IV. Vol. I.

ADDITIONS

TO THE

NARRATIVE OF THE VOYAGE.

N. B. THE impreſſion of the preceding part of the work was completed before the end of the year VI. (1798); but that of the remainder having occupied a rather conſiderable portion of time, I avail myſelf of it in order to inſert here ſome ADDITIONS that have been occaſioned by the recent publication of two voyages of which I had not been a able to obtain a knowledge when I was engaged in writing the NARRATIVE OF THE VOYAGE of Captain MARCHAND.

FIRST ADDITION.

For the INTRODUCTION.

IN the *INTRODUCTION*, I have contented myſelf with giving a ſummary account of the expeditions to the NORTH-WEST coaſt of AMERICA, which are poſterior to that of LA PÉROUSE; and I have announced that the Britiſh government had diſpatched veſſels to verify and complete the diſcoveries which had been made in theſe latter times between the 48th and the

60th

60th parallels. The voyage of Captain VANCOUVER *, publiſhed in LONDON towards the end of laſt year, 1798, and which did not reach us in FRANCE till the beginning of the year VII, (1799) has perfectly accompliſhed that object: and it may be ſaid that this part of the coaſt of the New World is at preſent better known, in reſpect to geography, than have been, and than ever will be perhaps, parts of the Old Continent much more within our reach, and which the Europeans have frequented ſince they have applied themſelves to navigation. The *INTRODUCTION* to the VOYAGE OF CAPTAIN MARCHAND may be conſidered as the introduction to the voyage of VANCOUVER: the latter muſt fix every uncertainty; and in peruſing the epitome of the diſcoveries that have been made from the year 1537 to 1790, the reader will follow with curioſity and intereſt, on the valuable charts which accompany VANCOUVER's narrative, the tracks that the ancient voyagers have ſcarcely pointed out to us; he will recognize the lands of which they had only had a glimpſe; he will know what they would have wiſhed us ever to be ignorant of; and, in admiring the immenſe progreſs made in the ſcience of navigation, he will not refuſe a tribute of praiſe to the learned men who have improved that ſcience, and to the indefatigable navigators who have found means to derive from its improvement, ſo great an advantage in order to ſucceed in completing the diſcovery and deſcription of the weſt coaſt of NORTH AMERICA.

* *A Voyage of Diſcovery to the North Pacific Ocean, and round the World, &c. by Captain* George Vancouver, *London*, 1798, 3 vols. 4to. with an *Atlas*.

SECOND ADDITION.

For the Islands called LAS MARQUESAS DE MENDOÇA.

TRAVELS in the UNITED STATES of AMERICA*, publiſhed in PARIS, in the month of Ventoſe of the preſent year VII, (March 1799) gives us an extract of a voyage performed in 1792, in the GREAT OCEAN, by Captain ROBERTS, an American, commanding the ſhip JEFFERSON, of five hundred tons burden, which ſailed from BOSTON, on the 29th November 1791.

The object of Captain ROBERTS's expedition was to trade for furs on the NORTH-WEST coaſt of AMERICA, and, as well as Captain MARCHAND, he put into the Bay of LA MADRE DE DIOS in the Iſland of WAHITAHÔ (or SANTA CHRISTINA) which he calls WHOANWOW. His intention in putting into this port was not only to procure water and refreſhments, but alſo to conſtruct a veſſel of ninety tons, the frame of which he had on board ready to be ſet up, and which ſerved him, in the ſequel, to ſecond the JEFFERSON in the fur-trade.

The extract which concerns the Iſlands called LAS MARQUESAS de MENDOÇA, occupies only three pages, although Captain ROBERTS ſtaid four months at LA MADRE DE DIOS, and might have given us ſome very intereſting details reſpecting the Iſland of WAHITAHÔ in particular, and ſome notions leſs uncertain than thoſe which we have reſpecting the other iſlands of the group; but he ſpeaks only of the inhabitants of the iſland where he had eſtabliſhed

* *Voyage dans les Etats Unis d'Amérique, fait en* 1795, 96, 97, par *La Rochefoucauld-Liancourt.* Paris, Du Pont, An. VII. 8 Vol. 8vo. Vol. III. pages 19 to 22.

himſelf,

himſelf, and even of them he ſays very little: Captain CHANAL to whom I have communicated this extract, finds, and juſtly, a great deal of incorrectneſs in the little that has been ſaid; and I own that I have found in it nothing that ought to be added to the deſcription, ſuch as I have been able to give, of the iſland and of the inhabitants, from the materials which have been furniſhed us by the voyagers who had viſited it before Captain ROBERTS.

According to the American Captain, the inhabitants of the MENDOÇA Iſlands, " have no other arms *than ſtakes* of extremely hard wood *very ſharp-* " *pointed*, and long ſlings, with which they throw large ſtones very far, and " *with much exactneſs*."

I know not whether by *ſtakes very ſharp-pointed* he means lances from nine to eleven feet long, and pikes or javelins of which they make uſe in war; but, independently of a ſort of ſabre, made of an extremely hard wood, in the form of the blade of an oar, he has omitted to make mention of the weapon the moſt formidable in the hand of a native of the MENDOÇA Iſlands, of the *caſcuarina* club, one of the ends of which conſiſts of a large knob; and which they take a delight in ornamenting with carving. The uſe of the ſling had been remarked by the French; they agree with Captain ROBERTS as to the great diſtance to which theſe iſlanders can throw a ſtone, but they do not in like manner admit of their addreſs in hitting the mark. (*See* Vol. I. page 119.)

Captain ROBERTS, ſpeaking of the attempt which the inhabitants of the neighbouring iſland (no doubt O-HIVAHÖA, or LA DOMINICA) made to carry off the anchor belonging to the ſmall veſſel which he had conſtructed, ſays that they preſented themſelves " with a flotilla of twenty canoes of *ninety* " *feet* in length."

The French, on their arrival in the Bay of La Madre de Dios, were viſited by fifty canoes which had come from O-Hivahöa: the length of the largeſt of thoſe canoes did not exceed twenty-five or thirty feet at moſt (*See* Vol. I. pages 117 and 118.)

The American Captain adds, that the inhabitants of O-Hivahöa are in a *continual ſtate of war* with thoſe of Wahitahô: but the French found them to live on terms of good underſtanding; and, on the firſt viſit which they paid to the Bay of La Madre de Dios, the natives of the two iſlands, aſſembled and mingled together, ſeemed to form but one tribe. I would not, however, vouch that this harmony is never diſturbed; for, after the firſt day, the French voyagers did not ſee them keep up on ſhore a communication with each other; but the canoes of the two iſlands paddled pell-mell round the ſhip, and no quarrels were ever ſeen to ariſe between the men of the two nations. The wounds which were perceived in ſeveral of the inhabitants of Wahitahô atteſt, indeed, that they have wars to maintain, and it is probable that it is principally againſt thoſe of O-Hivahöa, their neareſt neighbours: the latter, in general, appear more warlike, leſs familiar in the intercourſe of life than the former; and, as their iſland appears far from fertile, it may happen that ſterility and the ſcarcity which is the conſequence of it, induce them ſometimes to make incurſions among their neighbours, whom a land ever fruitful maintains in perpetual plenty; but it cannot thence be concluded that *the ſtate of war* is the *habitual ſtate* of the two tribes.

"Marriages," ſays Captain Roberts, "laſt only as long as it pleaſes the "married couple, eſpecially the men, who preſerve a great ſuperiority over "the women: *they never eat with them.* The ſame habitations frequently "contain the fathers and the children, even when the latter are married."

The

The American Captain muſt have had more opportunities than the French Captain of aſcertaining whether the inhabitants of WAHITAHÔ are acquainted with any rule in marriage; but, as I have ſaid, to judge of them from their conduct, it might be imagined that every man is the huſband of all the women, and every woman, the wife of all the men. (*See* Vol. I. page 110.) As to the ſuperiority of the men over the women, it does not appear that they have any other than that which Nature has given to the ſtronger; but the women are admitted to eat habitually with the men: Captain CHANAL who has frequently been preſent at their meals, has ſeen the men, women and children eat in common and feed on the ſame diſhes. (*See* Vol I. pages 130 and 131.)

According to Captain ROBERTS, "there is in this iſland a *King*, who is "*hereditary*, and village-chiefs, *who are likewiſe hereditary*; there is alſo a "certain *inequality* in the families, who all pay to the king and to the chiefs "*great marks of deference:* property is acknowledged, and reſpected: the num-"ber of *domeſtics* and *ſlaves* is proportionate to this property. The ſtealing "of productions, as well as of every other thing, is ſeverely puniſhed, and "the puniſhment *is ordered by the chiefs according to a ſentence which they* "*paſs*."

It has been ſeen (Vol. I. pages 132 to 134,) that neither the Engliſh, COOK and Meſſrs. FORSTER, nor the French, MARCHAND, CHANAL, and ROBLET, were able to diſtinguiſh what is the form of government of theſe iſlanders; they all agree merely on one point, that is, that, if thoſe who have ſometimes the appearance of being chiefs, have indeed ſome authority, it is not manifeſted by any act; and that the pretended ſubjects or vaſſals appear to pay no reſpect to majeſty or lordſhip, this is very different to thoſe great marks of reſpect which, according to Captain ROBERTS, all the families pay to the king and to the chiefs: it may be ſaid that, if, in the Iſland of WAHITAHÔ, there

exiſt

exiſt dignities, thoſe who are inveſted with them take a pleaſure in keeping *incog.* Thoſe voyagers who preceded the American Captain did not perceive that inequality of conditions, which diſtinguiſhes maſters, ſervants, and ſlaves; we have ſome difficulty in believing that, if this inequality were eſtabliſhed, it would have eſcaped the obſervation of the Engliſh and French: wherever there is a maſter, he is eager to ſhew that he has ſervants and ſlaves to wait on him. As to that tribunal of chiefs for trying thefts, and inflicting the puniſhment of the offence, the criminal code of WAHITAHÔ muſt, ſince the departure of the SOLIDE, have been greatly improved; for it has been ſeen that the chief who cauſed Captain MARCHAND's muſket to be reſtored aſſembled not his council to try the thief; he conſulted only his club. (*See* Vol. I. pages 42 and 43, 133 and 134.)

Captain ROBERTS does not expatiate on the natural productions of the country; he ſays merely that, "Potatoes and ſugar-canes are there cultivated; "that poultry, which is far from being in plenty, and hogs of the *Chineſe* "*breed*, which are to be found in ſome quantities, are eaten *roaſted*; and "that fiſh is eaten *raw*."

I preſume that the *potatoe*, mentioned in this extract, is the ſpecies of *ſweet potatoe* which is ſpoken of in MARCHAND's voyage (*See* Vol. I. page 83;) it is not there ſaid whether this root be *cultivated* at WAHITAHÔ, or whether it be a ſpontaneous production of the earth. With regard to the *ſugar-cane* Captain CHANAL aſſures us (*See* Vol. I. page 85,) that the natives are unacquainted with its value: it was not therefore cultivated there at the period of the voyage of the French.

This ſame Captain, whom I have conſulted reſpecting the ſpecies of hog which is procured at the MARQUESAS DE MENDOÇA, does not think that it is of the

Chineſe

Chinese breed. The *China* hog has a body thick and round; and its legs, which are short and slender, are not in proportion to the body: the hog of WAHITAHÔ is, in general, of a small size, but it is proportioned like that of our climates. The flesh of the Chinese hog is so fat, that it is thence insipid, and soon cloys; whereas the flesh of that of WAHITAHÔ, although fat, is of an exquisite taste: it is eaten with as much pleasure as that of the sheep, of which it has nearly the flavour: it is very superior to that of our sucking-pigs, of which the skin only is esteemed. It is probable that the excellent quality of the hogs of this island is due to the quality of the fruits with which they are fed, the same as those that constitute the principal food of the men who according to COOK's account, admit the hogs to their table (*See* Vol. I. page 114); which, no doubt, is neither frequent nor general, and it may be imagined that hogs are admitted to their table, only as dogs are admitted to ours.

Captain ROBERTS, as well as the French, observed that the natives of the island eat fish raw: it has been seen (*See* Vol. I. page 115) that sometimes too they eat pork without having dressed it.

We should be little informed of the character and manners of the inhabitants of WAHITAHÔ, if we were no better acquainted with them than from the account of the American Captain: we find only in the extract of his voyage that "during the four months which he staid at the island, he lived, "in general, on very good terms with the natives, a great number of whom "assisted him in his labours; but that one day they took a fancy to seize "upon his little vessel which was only half put together, and that a consider-"able assemblage of these islanders, headed by their King, manifested so "evidently their project of making an attack, that Captain ROBERTS, says "he found himself obliged to use force in order to repel them; that with "thirty-six men who composed his crew, he fired on the natives, killed

" ſeveral, wounded a great many others, and routed them all; that the next " day, they came to ſue for peace, and to bring him ſome of their wounded " to be dreſſed."

It is by comparing all the known facts and the opinions of voyagers, that, in the narrative of Captain MARCHAND's voyage, I have ſketched the character of this nation, who, in many reſpects, might have to complain of the Europeans much more than the latter have to complain of them (*See* Vol I. page 126.) What I have had it in my power to ſay of them will partly make up for the ſilence of the American Captain; but we muſt regret infinitely that having ſtaid four montns on ſhore, having lived in habitual ſociety with the natives of the iſland, he has not been more occupied in ſtudying and making known to us a race of men who appear to be ſtill in that period of civilization in which man is no longer ſavage, and in which he is not yet entirely civilized: what a rich harveſt might have been made by a philoſophic voyager!

Captain ROBERTS ſays that " the fermented liquor that the natives of " WAHITAHÔ make with a yellow root which they call *hary* (and which " Captain CHANAL thinks to be that of *ginger*, (*See* Vol. I. page 116) is anti- " ſcorbutic, and that they employ it as a remedy againſt the venereal diſeaſe, " which is very common in theſe iſlands ſince the firſt viſits of the Europeans, " and with which all the JEFFERSON's people were infected*."

It has been ſeen in the narrative of MARCHAND's voyage (Vol. I. page 113,) that Surgeon ROBLET does not ſay that the iſland was infected at the period

* From what is said of it, this beverage is prepared like the *ava* of the Taheiteans, and in a manner equally diſguſting to Europeans.

of

of that voyage; at leaſt the ſymptoms of the diſeaſe did not ſhew themſelves among the inhabitants: however, ſome made their appearance in a few individuals belonging to the SOLIDE after the ſhip had quitted the iſland; but Surgeon ROBLET thought he might attribute this as much to what they had brought as to what they might have received: a ſingle year is then ſufficient for this diſorder to have made a frightful progreſs. What reproaches have the Europeans to make to themſelves! What portion of the inhabited earth will be exempt from the ſcourge which they carry with them? But, on this point, we muſt not hope that they will ever amend, and the leſſon of the paſt is loſt for the time to come."

The American Captain appears not to have been ſo ſtruck by the beautiful proportions of the inhabitants of the MENDOÇA Iſlands as the Spaniards, the Engliſh, and the French have been: he ſays only, towards the end of the extract of his voyage that "the race of the men and women is handſome."

THIRD ADDITION.

For the Group of Iſlands to the North-weſt of the MARQUESAS DE MENDOÇA.

CAPTAIN ROBERTS, on quitting the Iſland of WAHITAHÔ, made ſail for the SANDWICH Iſlands.

"He affirms," it is ſaid in the extract of his voyage*, "that he diſcovered, on his route, *a group of iſlands*, not yet ſpoken of by any navigator, lying in 8° 40′ ſouth latitude, and 140° weſt longitude from GREEN-

* See *Voyage dans les Etats-Unis* par *la Rochefaucauld Liancourt.* Vol. III. page 23.

WICH (142° 20′ weſt from PARIS): he reconnoitred them without landing, called the cluſter WASHINGTON's Group, and gave ſome of the iſlands the names of ADAMS, JEFFERSON, HAMILTON, &c. Theſe iſlands had been ſeen the preceding year (1791) by Captain INGRAHAM of the ſhip HOPE of BOSTON; but he had done no more than perceive them and point out their ſituation. Captain ROBERTS ſays he landed in this archipelago, at NEWHEVE, which he named ADAMS's Iſland, latitude 8° 56′, an old man of ſeventy-five years of age whom he had found at RESOLUTION Bay (LA MADRE DE DIOS) in the Iſland of WOHANHOW (WAHITAHÔ), and who had been there for a long time. This old man was born in WASHINGTON's Group, at ONHAWA which Captain ROBERTS called the Iſland of MASSACHUSETTS. He examined the coaſt of ſome of them*."

It has been ſeen in the *narrative* of *Marchand's Voyage* (page 75 of this Vol.) that, while the SOLIDE lay in MACAO Road, Captain CHANAL was ſent on board an American ſhip, the captain of which was ill, and that he learnt from him that, in the beginning of the month of May 1791, in ſtanding from the MENDOÇA Iſlands to the NORTH-WEST coaſt of AMERICA, he had diſcovered to the north-weſt of that group, another group as extenſive as the former; that he had given names to the iſlands of which it is compoſed, but had not ſtopped there. It could not be doubted, from the latitude and the bearing which he indicated, that theſe were the ſame iſlands which Cap-

* It is not mentioned at what period Captain *Roberts* examined theſe iſlands. In the extract from his voyage, there are no other dates than that of his departure from *Boſton*, on the 29th of November 1791, and that of putting into an iſland in the *GREAT OCEAN*, on the 5th of July 1792, namely the Spaniſh Iſland *St. Ambroſe*, in latitude 26° 13 ſouth, where he ſtaid two months and a half, and procured thirteen thouſand ſeal-ſkins and a great quantity of oil. He muſt have arrived at *La Madre de Dios* about the beginning of September: and, as he there made a ſtay of four months, it may be ſuppoſed that it was about the latter end of December 1792, or the beginning of January 1793, that he perceived the *north-weſt* group of the *Marqueſas de Mendoça*.

tain MARCHAND had diſcovered a month later; but we were ignorant of the name of this Captain who had ſeen them firſt without examining them: the extract of Captain ROBERTS's Voyage informs us that the former Captain is named INGRAHAM, and that he commanded the ſhip HOPE of BOSTON.

It is this very group which Captain ROBERTS reconnoitred towards the end of 1792 or the beginning of 1793, and which he named WASHINGTON's Iſlands, at the ſame time not informing us whether this be the name which had been impoſed on them by Captain INGRAHAM, when he made the firſt diſcovery of them in the month of May 1791. It is to be regretted that, in the extract of Captain ROBERTS's Voyage, which I have here given at length, no mention is made of the number of iſlands of which this group is compoſed.

But this extract makes known to us the names which the natives of the group give to two of their iſlands: NEWHEVE, and ONHAWA. At the firſt glance we recognize the name of NEWHEVE in that of NEEV-HEEVA, which is written on TUPIA's chart, (*Plate IV.*) next to the moſt weſtern of the two ſouthern iſlands of the archipelago which compriſes the MARQUESAS DE MENDOÇA: and, when we know how many different ſounds the proper names of the Iſlands of the GREAT OCEAN obtain in paſſing through various European mouths, and what changes the different orthographies cauſe them to undergo, we are not far from recognizing O-HANEANEA, the name given by TUPIA to the moſt eaſtern of the two ſouthern iſlands of the ſame archipelago, in the name ONHAWA, which Captain ROBERTS ſays is that of one of the iſlands which he examined. It may therefore be ſaid that we know the names which TUPIA gave to five of the iſlands of the archipelago that compriſes, to the ſouth-eaſt, the group of the MARQUESAS DE MENDOÇA.

I remark

I remark that theſe two laſt-mentioned names are applied, on TUPIA's chart, to two of the iſlands of the SOUTH-EAST Group, that of the MENDOÇA Iſles, while we ſee by the account of Captain ROBERTS, that they belong to iſlands of the NORTH-WEST Group; and this may confirm what I had ſuſpected, (See Vol. I. page 173 Note*) that is, that in conſtructing the chart under the direction of TUPIA (and the miſtake may proceed from himſelf) the names which belong to the SOUTH-EAST Group have been applied to the NORTH-WEST Group, and thoſe of the NORTH-WEST Group, to the SOUTH-EAST Group: and, in fact, we have ſeen that the names of O-NITEIO, O-HIVA-HÖA and WAHITAHÔ, which are three names of the SOUTH-EAST Group or of the MENDOÇA Iſlands, have been applied on the chart to three of the iſlands of the NORTH-WEST Group, that which has been ſucceſſively reconnoitred by Captains INGRAHAM, MARCHAND, and ROBERTS.

In *Plate III*, No. I. of MARCHAND's Voyage, I have given the Plan of the iſlands which compoſe the NORTH-WEST Group, named by the French Captain, ILES DE LA RÉVOLUTION, as it was drawn by Captain CHANAL, who ſubjected it to the obſervations for the latitude and longitude and to the bearings taken on board the SOLIDE. We were then ignorant in FRANCE that in 1792, ſubſequently to the examination made by Captain ROBERTS, the NORTH-WEST Group had been viſited by an Engliſh Captain, and that it was from the plan drawn by this latter navigator that ARROWSMITH had placed the group on his planiſphere (*See* pages 77 to 79 of this Vol.) It was not, as I have already ſaid, till the beginning of the preſent year (1799) that we ſaw VANCOUVER's Voyage, publiſhed in LONDON towards the end of the year VI. (1798), and in which the Engliſh Captain gives an extract from the voyage of the DÆDALUS, under the command of Lieutenant HERGEST, in the courſe of which that navigator, after having put into the Bay of LA

MADRE

MADRE DE DIOS, in the Iſland of WAHITAHÔ, reconnoitred and viſited the NORTH-WEST Group. The impreſſion of the greater part of my work was completed for ſome months paſt, and the Plates were worked off, when I received VANCOUVER's Voyage; but I have added to *Plate III.* of MARCHAND's Voyage, No. II. a chart which is a copy of that of the NORTH-WEST Group, conſtructed by Lieutenant HERGEST, and Mr. GOOCH the aſtronomer who accompanied him, and I shall now give a tranſcript of the Extract, which VANCOUVER has inſerted in his Journal, of the part of that of HERGEST, which concerns the ſurvey of this Group. At the end of this tranſcript, I ſhall preſent ſome obſervations to which the chart and the narrative of MARCHAND may give riſe, compared with the account and the chart of HERGEST.

EXTRACT FROM THE JOURNAL OF LIEUTENANT HERGEST.*

"The DÆDALUS had anchored in the Bay of LA MADRE DE DIOS, on the 22nd of March 1792†."

"In the evening (of the 29th of the ſame month) about five o'clock, ſhe weighed and ſteered to the northward. At day-light the next morning, the 30th‡ ſhe came within ſight of ſome iſlands, which appeared to Mr. HERGEST to be new diſcoveries. Thoſe firſt ſeen were three in number, one

* *Vancouver's Voyage.* Vol. II. page 85 to 95.

† This date of the 22nd of March, which is to be found in page 85 of *Vancouver's* Journal (Vol II.) is remarkable, becauſe, in the ſequel of the Extract which he gives of the voyage of the *Dædalus*, there appear ſome evident miſtakes reſpecting dates.

‡ The original (page 90 and 91) gives the dates of the 29th of *October* and of the 30th of *October*, which are very evidently the 29th and the 30th of *March*, ſince it appears in the narrative, that the *Dædalus* paſſed only a *few days* at anchor in the Bay of *La Madre de Dios*, where, as has been ſeen, ſhe had anchored on the 22nd of March 1792.

bearing

bearing by compaſs* north by eaſt, the other north by weſt, and the third ſouth-weſt by ſouth. She fetched the ſouth-weſt part of the eaſternmoſt, where a good bay was found with a ſandy beach. Some rocky iſlets lie to the ſouth-eaſt of it; and, from a gully in the north-weſt part of the bay, there was an appearance of procuring a ſupply of water. To the eaſt of the ſouth point, there appeared another good bay; and along the weſtern ſhore, ſhallow broken water. But, on rounding that point, and hauling to the north along the weſt ſide, the broken water was found to extend not more than a quarter of a mile from the ſhore. On this ſide there is neither cove nor inlet, only a rocky ſhore, with two ſmall rocky iſlets off its north-weſt point. This iſland is about ſix leagues in circuit, and is in latitude 8° 50′ ſouth†: longitude 220° 51′ eaſt from GREENWICH (141° 29′ 15″ weſt from PARIS). It is inhabited by a tribe of ſeemingly friendly Indians, ſome of whom viſited the ſhip in their canoes. In the vallies were a great number of cocoa-nut and plantain trees, and the whole iſland preſented an infinitely more verdant and fertile appearance than thoſe they had juſt quitted (the MARQUESAS DE MENDOÇA).

"From hence Mr. HERGEST ſtood over to the ſouthernmoſt iſland, which appears at a diſtance like a remarkably high rock, with three peaked rocks cloſe to it; theſe are about the middle of the iſland. The night was ſpent in keeping his ſtation near it, and, in the morning, his courſe was directed towards its ſouth-weſt point. As the ſhore was approached, the land was

* *Hergeſt*'s Journal makes no mention of the variation of the magnetic needle, but from the obſervations made on board the *Solide*, on the 21ſt of June 1791, in ſight of *Ile Marchand (Hergeſt's Trevenen*'s Iſland) it was 4° 32′ eaſt, See *the Journal of the Route* at the end of this Volume.

† The ſcale of the original chart which is to be found *in Vancouver's Voyage*, is marked, by miſtake, 80° and 90° inſtead of 8° and 9°.

ſeen

ſeen to be well cultivated and numerouſly inhabited. More than one hundred Indians were ſoon aſſembled round the ſhip in their canoes, diſpoſing of cocoa-nuts, plantains, &c. for beads and other trifles, and behaving in a very friendly manner. At the ſouth-weſt end of this iſland is a very good bay, with a ſandy beach in its eaſtern part*. Along the ſouthern ſide are other bays; one in particular appeared to retire deeply in towards the ſouth-eaſt end of the iſland, having a ſmall iſlet lying off it, not unlike in ſhape to the ſteeple of a cathedral†, and other rocks and iſlets. From the weſt point of this iſland, forming alſo the weſt point of the fineſt and deepeſt bay it affords, its ſhores trend round to the north-eaſt; and, like the weſt ſide of the iſland he was at the preceding day (which received the name of RIOU'S ISLAND) are rocky, and bear rather a ſteril appearance. This iſland obtained the name of TREVENEN'S ISLAND ‡, it is ſituated in latitude 9° 14′ ſouth, longitude 220° 21′ eaſt from GREENWICH (141° 59′ 15″ weſt from PARIS.)

"In the forenoon of the 1ſt of April §, the ſouth ſide of the third iſland was paſſed, which was named SIR HENRY MARTIN'S ISLAND ‖; immediately to the weſt of its ſouth-eaſt point, called Point MARTIN, is a deep, well-ſheltered bay, bounded by ſandy beaches: this obtained the name of COMPTROLLER'S BAY; it was not examined, but, on paſſing, had the appearance of a ſafe and commodious port. At its head was a break in the ſhores, ſuppoſed by ſome to be the mouth of a rivulet, but as it appeared too large for

* See what is ſaid of this bay in the *Voyage of Marchand*, who cauſed it to be viſited. Vol. I. pages 148 and 149.

† This is the iſlot named *le Pic* (the Peak) by Captain *Marchand* (*See* Vol. I. page 143.)

‡ This is the *Ile Marchand* reconnoitred by the *Solide*.

§ This date is the ſame in the original page 93: which confirms what I have ſaid (page 207, note ‡, of this volume) of the error of the two preceding dates, 29th and 30th October, inſtead of the 20th and 30th of March.

‖ This is the *Ile Baux* of Captain *Marchand*.

ſo ſmall an iſland to afford, Mr. HERGEST was rather inclined to believe it only a deep cove.

" The DÆDALUS was here viſited by many of the natives, paddling and ſailing in their canoes, who behaved in a very civil and friendly manner. About two leagues to the weſtward of Point MARTIN is a very fine harbour, extending deep into the iſland, and bounded by a moſt delightful and fertile country. Mr. HERGEST, accompanied by Mr. GOOCH, went with the cutter to take a ſketch and to examine the port, which he called PORT ANNA MARIA. It was found to be very eaſy of acceſs and egreſs, without any ſhoals or rocks that are not ſufficiently conſpicuous to be avoided; the depth at its entrance twenty-four fathoms, gradually decreaſing to ſeven fathoms, within a quarter of a mile of its ſhores; the bottom a fine ſand, and the ſurrounding land affording moſt perfect ſecurity againſt the winds and ſea in all directions. An excellent run of fine water flows into the harbour, which poſſeſſes every advantage that could be deſired.

" The country ſeemed to be highly cultivated, and was fully inhabited by a civil and friendly race of people, readily inclined to ſupply whatever refreſhments their country afforded. The DÆDALUS's people were induced to entertain this opinion from the hoſpitable reception they experienced on landing, from the chiefs and upwards of fifteen hundred of the natives who were aſſembled on the ſhores of the harbour. On their return to the ſhip they found the ſame harmony ſubſiſting there with the Indians, who had carried off and ſold a ſupply of vegetables and ſome pigs*.

* Captain *Marchand* had met with a reception no leſs friendly at the iſland bearing his name, *Hergeſt's Trevenen*'s Iſland (*See* Vol. I. pages 151, 154, and 155.)

" MR.

" Mr. Hergest renewed his route along the ſouth-ſide of the iſland to its ſouth-weſt point, when he hauled his wind along the weſtern ſide. This is a rocky iron-bound ſhore without cove or bay. It had a verdant appearance, but no great ſign of fertility; nor were any habitations or natives perceived.

" About ſun-ſet, he diſcovered what appeared like a large rock to the north-weſtward, about ſix or ſeven leagues diſtant; and, during the night, they remained near Sir Henry Martin's Iſland; but, in the morning, not being able to fetch its north-eaſt point, he quitted it; its north-weſt ſide appeared to contain ſome ſmall bays; and towards its north-eaſt extremity, the land turned, apparently, ſhort round, forming a bay ſomething ſimilar to, but not ſo deep as Comptroller's Bay. Another rock juſt above water now ſhewed its head to the eaſtward, and to the northward of that before-mentioned. Theſe rocks * Mr. Hergest repreſents to be dangerous; they lie about weſt by north, about ſix leagues from the weſtern ſide of Sir Henry Martin's Iſland †, which is about ſixteen leagues in circuit. Its centre is ſituated in ſouth latitude 8° 51′, longitude 220° 19′ eaſt from Greenwich (142° 1′ 15″ weſt from Paris.)

* On the chart theſe are called *Hergeſt's Rocks*: they are the rocks named *Les Deux Frères* in the Journal and on the Chart of Captain *Marchand*.

† This ſituation of the rocks, in regard to *Sir Henry Martin*'s Iſland, ſuch as the Journal indicates, is far from being conformable to that in which they are laid down on the chart that accompanies the extract from the Journal: on the chart the middle of the two *Rocks* is placed at the diſtance of eleven leagues between weſt by north and weſt-north-weſt, with reſpect to the north-weſt point of *Sir Henry Martin*'s Iſland, the part of the Iſland the neareſt to the *Rocks*; the diſtance is ten leagues one-third, if meaſured between this ſame point and the weſt coaſt of the *Eaſt Rock*, that is to ſay, at the ſhorteſt diſtance; and it is *twelve leagues and a half*, if meaſured between the point of the iſland and the weſt point of the *Weſt Rock*. If the latitude and longitude of theſe rocks were inſerted in the Journal, we ſhould determine on the poſition which Lieutenant *Hergeſt* meant to give them with regard to the iſland; but the want of agreement between the Journal and the Chart leaves a great uncertainty reſpecting this poſition.

 " After

" After leaving this iſland, two others were diſcovered to the northward of them. On the morning of the 3d of April *, Mr. HERGEST bore up to the ſouthward along the eaſt ſide of the ſouth-weſternmoſt. This is the largeſt of the two, its ſhores are rocky, without any coves or landing-places; and, though its ſurface was green it produced no trees, yet a few ſhrubs and buſhes were thinly ſcattered over the face of the rocks; nor did it ſeem to be otherwiſe inhabited than by the tropical oceanic birds. Theſe were in great numbers about it, and it ſeemed to be a place of their general reſort. The north-weſt ſide, however, had a more favourable aſpect, and, although its ſhores were alſo rocky, a number of trees were produced, as well on the ſides of the hills, as in the vallies. This ſide afforded ſome coves where there is good landing, particularly in one near the middle: this, from the appearance of its northern ſide, was called BATTERY Cove. A little more than a mile to the north of this cove is a bay, which Mr. HERGEST and Mr. GOOCH examined. Good anchorage and regular ſoundings were found from eighteen to five fathoms water; the bottom a fine clear ſand. An excellent run of freſh water diſcharged itſelf into the bay near a grove of cocoa-nut trees; here they landed, and found a place of interment, and a hut near half a mile from it by the ſide of a hill; but there were no people, nor the appearance of any having been recently there; although it were manifeſt that they did, on ſome occaſions reſort to the iſland. This induced Mr. HERGEST to forbear cutting down any of the cocoa-nut trees as he at firſt intended to do; and he procured by other means as many of the fruit as ſerved the whole crew, with five to each perſon.

" The landing was but indifferent on account of the ſurf; but water is eaſily obtained.

* This date is the ſame in the original.

" After

" After aſcertaining the laſt-mentioned iſland to be eight miles long and two miles broad, and to be ſituated in ſouth latitude 7° 53′, longitude 219° 47′ eaſt from GREENWICH (142° 33′ 15″ weſt from PARIS) they took leave of theſe iſlands the next morning; and to the north-eaſt of the laſt, at the diſtance of about a league they diſcovered another, nearly round and much ſmaller*, with two iſlets lying off its ſouth-weſt point; to this was given the name of ROBERTS's Iſland.

" Mr. HERGEST ſtates that, during the time he was among theſe iſlands and at the MARQUESAS, they were ſubject to frequent heavy ſqualls and much rain.

" He compares the inhabitants of this group to thoſe of the MARQUESAS, in colour and ſize; but in manners, behaviour, dreſs, and ornaments, excepting that of their being leſs punctured, they more reſemble the people of TAHEITEE and the SOCIETY Iſlands.

" On the firſt information of the DÆDALUS having viſited theſe iſlands, (ſays VANCOUVER towards the end of the extract which I have juſt given from Lieutenant HERGEST's Journal) I concluded that they had not been ſeen before, and to commemorate the diſcovery of a very worthy though unfortunate friend † and fellow-traveller in my more early periods of navigating theſe ſeas, I diſtinguiſhed the whole group by the name of HERGEST's ISLANDS. But I have ſince been informed, that theſe iſlands had been diſcovered and

* Here it appears that there is a tranſpoſition in point of time, for *Hergeſt* muſt have ſeen this latter iſland when he was ranging along the eaſt coaſt of the former, and not when he had placed it between him and the latter.

† Mr. *Hergeſt* and Mr. *Gooch* were afterwards maſſacred by the natives of *Woahoo*, one of the *Sandwich* Iſlands.

landed

landed upon by ſome of the American traders, and that, in fine weather, the ſouthernmoſt is viſible from HOOD's Iſland, the moſt northern of the MARQUESAS. Hence they are conſidered by ſome as properly appertaining to that group, although neither the Spaniſh navigator, MENDAÑA, who diſcovered the MARQUESAS, nor Captain COOK who viſited them after him, had any knowledge of ſuch iſlands exiſting."

The examination made by Lieutenant HERGEST, of the group of iſlands ſituated to the north-weſt of the MARQUESAS DE MENDOÇA, will ſerve me to rectify in ſome points that which had been made in the month of June 1791, by Captain MARCHAND.

1ſt. From the poſition which ARROWSMITH's Planiſphere had given to RIOU's Iſland in regard to TREVENEN's Iſland *, I might have ſuppoſed that his RIOU's Iſland was the ILE PLATE of Captain MARCHAND; but it is ſeen, by HERGEST's Chart, that RIOU's Iſland is ſituated at the diſtance of about ſeven leagues from coaſt to coaſt, and directly to the eaſtward of the middle of the eaſtern coaſt of SIR HENRY MARTIN's Iſland (which is ILE BAUX in the SOLIDE's Chart), and about ten leagues from centre to centre: Captain MARCHAND, from the courſe which he held, could not therefore perceive this RIOU's Iſland, which appears leſs elevated than the others; he never was nearer to it than twelve leagues; and it was concealed from him by his ILE BAUX, when he paſſed to the weſtward of the latter.

On the SOLIDE's chart muſt be added the RIOU's Iſland of the DÆDALUS, the centre of which is to be placed ten leagues to the eaſtward of the centre of ILE BAUX, where it will be ſituated in 8° 54′ ſouth latitude, and 141° 56 or 57′ weſt from PARIS.

* *See* pages 77 to 79 of this volume.

2nd.

2nd. Lieutenant HERGEST fixes the latitude of his TREVENEN's Iſland, ILE MARCHAND of the SOLIDE, in 9° 14′, and its longitude in 220° 21′ eaſt from GREENWICH, or 141° 59′ 15″ weſt from PARIS; and this poſition anſwers on his chart to the centre of the iſland; but according to the obſervations of MARCHAND and CHANAL in the SOLIDE, made at a very little diſtance from the moſt weſtern point of the ſame iſland, and reduced to its centre, its latitude is 9° 21′, and its longitude 142° 19′ (*See* Vol. I. page 166): the latitudes differ then by ſeven minutes, and the longitudes by twenty. It is not mentioned in the Extract from HERGEST's Journal whether the latitude was by obſervation *, nor by what means the longitude was determined. I obſerve that the longitude fixed by HERGEST makes the difference of meridian between the NORTH-WEST Group and that of the MARQUESAS, ſmaller by 20 minutes, or about 6⅔ leagues than the difference which reſults from the obſervations made on board the SOLIDE: for I ſuppoſe that HERGEST, as was done by MARCHAND and CHANAL, admitted the longitude of the Bay of LA MADRE DE DIOS in the MARQUESAS, ſuch as it was deduced from the obſervations made in Captain COOK's ſecond voyage †, and that it is to this longitude that he has reduced thoſe of the Iſlands of the NORTH-WEST Group. Lieutenant HERGEST places on his chart the eaſtern coaſt of his TREVENEN's Iſland (ILE MARCHAND) in 139° 34′ weſt from GREENWICH, or 141° 54′ weſt from PARIS: but the weſt point of LA DOMINICA or (O-HIVAHÖA) of the MARQUESAS is ſituated in 141° 31′ 15″, (according to COOK's obſervations which place the middle of the iſland in 141° 22′); TREVENEN's Iſland

* It is poſſible that it was only by *account*; for it has been ſeen in page 213, of this volume, that *Hergeſt* complains of having met with "frequent heavy ſqualls and *much rain*," during the time he was among theſe iſlands.

† *See* Note XXX. But independently of the difference of meridians eſtimated from the dead reckoning, *Marchand* and *Chanal* determined by direct obſervations taken on the 22d and 24th of June, the longitude of *l'Ile Marchand*, and that of the Northern iſlands (See the *Journal of the Route*); and the reſult of the dead reckoning differed not from that of the obſervations.

therefore could not be eleven leagues diſtant, to the north-weſt, from the weſt point of La Dominica: and can it be ſuppoſed that Captain Cook who, by his route, ſtood as far as this point of La Dominica, and even a little without the point, would not have perceived a lofty iſland whoſe diſtance had not been eleven leagues? I am therefore of opinion that the longitude deduced from the obſervations and the dead reckoning of the Solide, which carries the north-west group 10 minutes more to the weſtward than the longitude aſſigned to it by Hergest's journal and chart, ought to be preferred to the latter which brings the two groups too near to each other.

If this proof did not appear ſufficient for cauſing the longitude of Ile Marchand (Trevenen's Iſland), as deduced from the obſervations made on board the Solide, to be adopted in preference to that given to this iſland by the chart conſtructed on board the Dædalus, I ſhould obſerve that Captain Marchand perceived the iſland which bears his name from the anchorage of La Madre de Dios (Vol. I. pages 143 and 144); and that, for two ſucceſſive days, in the cleareſt weather, he ſet this iſland (or rather its loftieſt peak) bearing between weſt-north-weſt and north-weſt by weſt, allowing for the variation. The latitude of the Bay of La Madre de Dios, according to the obſervations made in Cook's Second Voyage, is 9° 55′ 30″, and that of Ile Marchand, in its middle, is, from the obſervations made on board the Solide, 9° 21′: the difference of latitude is therefore 34½ minutes, or 34½ miles. If, with this difference of latitude, and the angle of north-weſt by weſt (33° 45′) the oblique triangle be ſolved, it will be found that the difference of meridian between the two points whoſe latitudes we have, muſt be 51½ miles or 52′ 15″, (in the mean parallel of 9° 33′): that which reſults from the longitude of Marchand's Iſland, deduced from the obſervations made on board the Solide, and compared to the longitude of La

Madre

MADRE DE DIOS, is only 50′ 5″; it is therefore ſmaller by 2′ 10″ than that given by the calculation of the triangle: it is not then too great, although it exceeds, by 20 minutes, the difference of meridian which the chart of the DÆDALUS has given between TREVENEN's Iſland (ILE MARCHAND) and the Bay of LA MADRE DE DIOS: and it may be ſeen that the difference of longitude between the two points would be much greater ſtill, if, in preſerving the angle of bearing 33° 45′, obſerved from LA MADRE DE DIOS, we admitted the latitude of 9° 14′ (in lieu of 9° 21′) which Lieutenant HERGEST has given to TREVENEN's Iſland (ILE MARCHAND); for then the difference of latitude between that iſland and LA MADRE DE DIOS, would be 41′ 30″ (in lieu of 34′ 30″); and the difference of meridian would be 1° 3′ (in lieu of 52′ 15″); whereas the chart of the DÆDALUS (ſtill taking for the longitude of LA MADRE DE DIOS, that of COOK's ſecond voyage) makes the difference of meridian only about half a degree.

I am therefore of opinion that we cannot heſitate to prefer, for ILE MARCHAND (TREVENEN's Iſland), the longitude determined by the obſervations of the SOLIDE, to that aſſigned to it by the chart of the DÆDALUS, which is ſmaller than the former by 20 minutes: I ſhould not even be aſtoniſhed that, in the ſequel, freſh obſervations ſhould prove that we muſt rather increaſe the difference of meridian, in regard to LA MADRE DE DIOS, which was deduced from the obſervations taken on board the SOLIDE in ſight of her ILE MARCHAND.

3. The Journal of the DÆDALUS gives for the ſituation of the centre of SIR HENRY MARTIN's Iſland (the SOLIDE's ILE BAUX) latitude 8° 51′, and longitude 220° 19′ eaſt from GREENWICH, or 141° 1′ 15″ weſt from PARIS. According to the obſervations and bearings taken by Captains MARCHAND and CHANAL (Vol. I. page 166) the latitude of the middle of the iſland is 8° 54′,

 and

and the longitude 142° 25′: the difference between the determination of the DÆDALUS, and that of the SOLIDE, is therefore 3 minutes in the latitude, and 24 minutes in the longitude. The difference of meridian between this iſland and the preceding would be only 2 minutes according to HERGEST, and it is 6 minutes according to MARCHAND and CHANAL; the latter deduced the difference of meridian of the two iſlands from bearings taken of both at the ſame time, and croſs bearings; but I am ignorant by what means the former determined this difference, ſuch as it is deduced from the relative ſituation given to the two iſlands in his Journal and on his Chart.

4. The weſt coaſt of the moſt weſtern of HERGEST's ROCKS (LES DEUX FRÈRES of the SOLIDE) is ſituated on the Chart of the DÆDALUS, in latitude 8° 37′ 30″, and 140° 20′ weſt from GREENWICH, or 142° 40′ 15″ weſt from PARIS *, and on the SOLIDE's chart, in latitude 8° 42′, and longitude 142° 55′: the difference of the latitudes is 4 minutes and a half, and that of the longitudes 15 minutes. From within ſight of ILE BAUX (SIR HENRY MARTIN's Iſland of the Engliſh), the SOLIDE ſtood directly for the Rocks named by the French LES DEUX FRÈRES; ſhe paſſed, within a quarter of a mile, to the weſtward of the moſt weſtern; and, from this poſition, Captain MARCHAND took the bearing of the rock in regard to the north-weſt point of the iſland: LES DEUX FRÈRES lie, with reſpect to each other, eaſt and weſt. As no mention is made in the Journal of the DÆDALUS of the method employed for fixing the poſition of the rocks in regard to SIR HENRY MARTIN's Iſland; and as their diſtance from that iſland ſuch as it is given by the Journal is very different from that aſſigned to them on the Chart which accompanies it, I think that we ought to adhere to the poſition reſulting from the route and the bearings of the SOLIDE.

* For the compariſon I employ the poſition which the Chart aſſigns to theſe *Rocks;* for it has been ſeen before, (page 211 note †) that the poſition given to them by the *Journal* is very different from that in which they are laid down on the chart.

5. The

5. The result of the observations for the latitude and longitude made by Captains MARCHAND and CHANAL on the 24th of June (Vol. I. page 166) combined with bearings taken of the land, places the middle of ILE MASSE, that is, the most southern elevated part of the little group of ROBERTS's Islands in the English Chart, in latitude 8° or 8° 1′, and longitude 142° 52′: this same point is situated, on the English Chart, in latitude 7° 57′, and longitude 140° 13′ 30″ west from GREENWICH, or 142° 33′ 45″ west from PARIS: the difference between the two positions is therefore from 3 to 4 minutes in the latitudes, and 18 ¼ minutes in the longitudes. It is seen that, on the French chart, the ILES MASSE and CHANAL occupy together 16 minutes in latitude; while the group of ROBERTS's Islands, which represent the former on the English chart, there occupy only 10 minutes. They are placed on the SOLIDE's chart according to a bearing (in which allowance is made for the variation of the compass) taken on the 24th of June at noon, at the moment of the observation for the latitude, and inserted in the manuscript journal of Captain CHANAL as follows: ILE MASSE, from east 30° south to east 8 or 10° south, distant six leagues: ILE CHANAL, from east to east 10° north, twelve leagues. If it were wished to attribute to an error in the SOLIDE's bearings, the difference of 6 minutes that is to be found between the space which the group of these islands occupies in latitude on the one chart, and that which it occupies on the other, we must suppose that a much greater error has been committed with respect to the distance of six leagues at which the SOLIDE was estimated from ILE MASSE, which was the nearest to her. I therefore presume that the difference of the parallels between which the group is comprehended, must be larger than it is on the chart of the DÆDALUS. But I am, at the same time, of opinion, that the configuration and the disposition of these islands, such as they are seen on the English chart, is far preferable to those which are delineated on the French chart. Lieutenant HERGEST visited them and examined them minutely; whereas Captain MAR-

CHAND saw them only in passing, and at a sufficient distance to leave a great uncertainty respecting any other determination than of the difference of latitude of the two extreme north and south points, and their relative position in regard to the ILE BAUX of the SOLIDE, the Sir HENRY MARTIN's Island of the DÆDALUS.

In recapitulating the differences which we have discovered between the two charts, it is seen that all the latitudes and longitudes of the English chart are smaller than those of the French chart; namely:

	in Lat.	in Long.
For ISLE MARCHAND, or TREVENEN's Island	7′	20′
For ILE BAUX, or SIR HENRY MARTIN's Island	3	24
For LES DEUX FRÈRES, or HERGEST's Rocks	$4\frac{1}{2}$	15
For ISLE MASSE, the south part of ROBERTS's Islands	3	18

From the reasons which I have stated, I am of opinion that the English chart, by giving to the NORTH-WEST Group a longitude less westerly than that which results from the observations made on board the SOLIDE, brings this group too near to that of the MARQUESAS DE MENDOÇA. As for the latitudes, supposing that all those inserted in HERGEST's Journal were *by observation*, of which we are ignorant; the differences between those observed on board the SOLIDE, with the exception of the first which is 7 minutes, are so small that we may imagine they are owing to the difference of the instruments, to the manner of observing, &c. And we might take for the true latitudes, the mean between the results given by the two navigators, the more especially as they are not reduced to a determined point, such as a cape, a harbour, &c. but to the centre of each island.

If I wished to construct a chart of the group situated to the north-west of

the

the MARQUESAS DE MENDOÇA, I would make uſe of the poſitions with which we are furniſhed by the SOLIDE's journal; but I would employ for the extent and the configuration of the iſlands, to which I would add RIOU's Iſland, thoſe given them by the chart conſtructed in the voyage of the DÆDALUS; for, with the exception of ILE MARCHAND (the TREVENEN's Iſland of HERGEST), the others were not ſeen from the SOLIDE but at a diſtance which admits of preſenting maſſes only; whereas they were moſtly viſited, and ſurveyed more minutely by the DÆDALUS. We are indebted to Lieutenant HERGEST for a knowledge of the excellent harbour, called by him PORT ANNA MARIA, on the ſouth coaſt of ILE BAUX, or SIR HENRY MARTIN's Iſland, and of a bay ſituated on the ſame coaſt near its ſouth-eaſt point, which had the appearance of a ſafe and commodious port: it cannot but be conſidered as a fortunate circumſtance to have diſcovered two good harbours in a populous and fertile iſland, in the midſt of other iſlands which are equally ſo, and in a latitude where it was of importance to be acquainted with places of ſhelter which can furniſh water and refreſhments to ſhips croſſing the GREAT OCEAN.

What we read, in the extract from the journal of the DÆDALUS, reſpecting the peaceable, friendly, and hoſpitable diſpoſition of the natives of theſe iſlands, agrees perfectly with what has been related of them in the Narrrative of MARCHAND's VOYAGE (Vol. I. pages 150, 151, 154, and 155.)

It has been ſeen (pages 225, 226, 231, and 232 of this Vol.) by the extract from the voyage of the American Captain, ROBERTS, that the natives of the NORTH-WEST Group ſometimes have a communication with thoſe of the SOUTH-EAST Group, ſince that Captain met at LA MADRE DE DIOS in WAHITAHÔ, one of the MARQUESAS, an old man of ſeventy-five years of age, born at ONHAWA, one of the iſlands of the NORTH-WEST Group, to whom he gave a paſſage in his

his ſhip, and whom he landed at NEWHEVE *, another iſland of the ſame group. It will not be ſuppoſed that an old man had embarked in a ſhip, with ſtrangers, ſolely for the pleaſure of rambling over the world, of which he could have no idea; it is probable that he intimated in ſome way to Captain ROBERTS, that he was born in a diſtant land whoſe ſituation in regard to WAHITAHÔ he pointed out; and that, on this indication, the American Captain propoſed to him to take him on board his ſhip, giving him the hope that he would ſoon reſtore him to his native country. But Captain ROBERTS having met a native of the iſlands of the NORTH-WEST Group on an iſland of the SOUTH-EAST Group, does not prove that the communication from the one group to the other is habitual; the age even of this inhabitant of the NORTH-WEST Group, and the determination which he ventured to take of abandoning himſelf to ſtrange men, who muſt have appeared formidable to him, but who promiſed to carry him back to his own country, ſeem to indicate that the means of communication from the one group to the other are as difficult to theſe iſlanders, as the opportunities of them muſt be rare: Captain COOK and Captain MARCHAND never ſaw at LA MADRE DE DIOS any other canoes than thoſe which had come thither from O-HIVAHÔA, MENDAÑA'S LA DOMINICA.

* To judge from the latitude of 8° 56′, which Captain *Roberts* aſſigns to the Iſland of *Newheve*, (page 208, of this Vol.) this muſt be the *Ile Baux* of the *Solide*, the *Sir Henry Martin's* Iſland of the *Dædalus*.

FOURTH ADDITION,

For the Iſland of TINIAN.

IN the Narrative of MARCHAND's VOYAGE (pages 37 to 58 of this Vol.), I have preſented two very different pictures of the Iſland of TINIAN: that which RICHARD WALTER, Chaplain to Commodore ANSON, has drawn us of the ſtate of the iſland in 1742; and that of the ſtate in which it has appeared in later times: in 1765, to Commodore BYRON; in 1767, to Captain WALLIS; in 1787, to Captain PORTLOCK; in 1788, to Captain GILBERT and to Captain SEVER, ſeparately. I ought likewiſe to have mentioned the deſcription given of it by Lieutenant GEORGE MORTIMER, of the Marines, a paſſenger on board the brig MERCURY, commanded by Captain HENRY COX, who touched at TINIAN on the 12th of December 1789, and came to an anchor in that very road, off the ſouth-weſt point of the iſland, where all the navigators of his nation who preceded him, had alſo anchored. I ſhall repair this omiſſion, and make Lieutenant MORTIMER ſpeak for himſelf*.

"On our arrival, a fine breeze ſetting off the land, ſaluted us with the moſt fragrant and delightful odours; and we were ſoon gratified with the ſight of ſome beautiful white cattle, feeding and friſking about among the trees; which added greatly to the charming appearance of this iſland. The boats were hoiſted out, and the captain with a party of us went on ſhore, where we

* *Obſervations and Remarks made during a voyage to the Iſlands of Teneriffe, &c.—North-weſt coaſt of America, &c.—Otaheite, &c.—Tinian, and thence to Canton.—In the Brig* Mercury, *commanded by* I. H. Cox, *Eſq. By Lieut.* George Mortimer *of the Marines.* London, 1791. 4to. pages 64 and following.

expected

expected to procure ſome freſh beef; but were diſappointed, as the cattle retired among the woods the inſtant they ſaw us; and it would have been in vain to have purſued them for the underwood was nearly impenetrable: we therefore returned on board again, after having loaded the boat with wood, and gathered a quantity of fine limes.

"The next morning we went on ſhore again, and landed further to the northward than we had done on the preceding day. Here we found ſeveral huts erected by the Spaniards who come here annually from their ſettlement at GUAM to procure beef for the garriſon of that iſland. The Spaniards, or ſome other people, muſt have quitted TINIAN but a very ſhort time before our arrival, as they had left a wild hog in a ſtye, that had died but lately, and a fine dog, which we caught, and carried on board with us. We were directed by a beaten path, about forty yards in length from the huts, to the well mentioned by Lord ANSON and Commodore BYRON; and though the water it contains is not the beſt in the world, it by no means deſerves the reproaches beſtowed upon it by the Commodore, ſince we neither found it brackiſh nor full of worms, as he aſſerts it to have been *. And here I cannot help obſerving, that this gentleman ſeems to have taken as much pains to depreciate this iſland, as Lord ANSON had been too laviſh in his encomiums on it †; for, whatever may have been the ſtate of TINIAN

* Commodore *Byron* was at *Tinian* in the month of Auguſt, and Captain *Cox*, in the month of December, the difference of the ſeaſons might probably occaſion a difference in the ſtate of a *well:* Captain *Gilbert*, in the month of Auguſt 1788, found it dry.

† It is difficult to pronounce between two voyagers, who both declare, *I ſaw it*; we muſt, however, remark, that all the navigators who have touched at *Tinian* ſince *Byron* deſcribed to us its preſent ſtate, have confirmed what he has ſaid of it.

The manner in which ſeamen view objects depends a little on the ſituation in which they find themſelves when they land in a country: we are leſs difficult in proportion as we have more wants; the land has ſo many charms, when, for a length of time, we have been condemned to ſee nothing but ſky and water!

when

when his Lordſhip was there, future viſiters may look about in vain for thoſe delightful lawns, painted in ſuch glowing colours by the author of his voyage.

" Our people being ſet to work to cut wood for fuel, and other purpoſes, I ſet out from the huts where they were ſtationed, in company with our third mate and one of the ſeamen, in purſuit of game. We at firſt followed the traces of a path; but it ſoon failing us, we were obliged to force our way through the thickets, in hopes, as we got into the interior part of the country, we ſhould get clear of the trees and underwood: which we did, after having proceeded a conſiderable diſtance with great labour and fatigue; but we were ſtill ſo much incommoded by a kind of wood that grew as high as our breaſts, by the heat, and by an intolerable number of flies, that I quitted my companions, who wiſhed to penetrate a little farther into the country, and made the beſt of my way back to the wooding party at the huts, where I did not arrive till late in the afternoon, being nearly exhauſted with the fatigue of puſhing through the buſhes, and climbing trees, to ſee that I was going in a proper direction, which was a very neceſſary precaution, as I was at one time loſt for upwards of two hours. I met with a great many wild hogs; and I had nearly ſtumbled upon an animal which, on being rouſed, darted through the thicket with ſuch velocity, that I could not diſtinguiſh what it was; but ſuppoſe it to have been one of the guanacoes deſcribed by Lord Anson, and which are ſaid to abound in the neighbouring Iſlands of Saypan and Aguigan. I ſaw alſo ſome fowls in my ramble, and ſhot a pig. Our third mate, who returned about half an hour after me, reported, that ſoon after I had ſeparated from him, he fell in with a herd of cattle, and ſhot one of them, a fine young bull; but, having only one man with him, and it being a conſiderable diſtance from the beach, he was obliged to leave the carcaſs in the

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charge of his companion, who consented to remain with it all night; being apprehensive they might not have found the place again, had they both returned together.

" Next morning, a party was sent to procure some of the animal; but, upon their arrival, the greater part of it was found to be tainted and entirely spoiled; however, some pieces were cut from the parts that were the least affected and brought on board, which furnished us with an excellent dish of soup, and some steaks, the meat being *very tender* and fine grained (we have no difficulty in believing it, *quid non fames!*) Wild hogs and poultry are in great abundance at TINIAN; and though the latter are shy and difficult to come at, on account of the underwood, it is pleasing to hear them crowing and cackling in every direction; so that it is difficult to divest one's self of the idea of being in the vicinity of some country village, or large farm-yard. TINIAN produces plenty of limes, lemons, guavas, some cocoa-nuts, custard-apples, and indifferent oranges, with a variety of beautiful trees, among which was the bramin and bread-fruit trees, but the latter had no fruit upon them; and the cotton shrub. In our different excursions on shore, we met with the remains of several of those curious edifices described by Lord ANSON, and supposed to have been erected by the original inhabitants of the island. These buildings are of a most singular structure, and consist, in their present state, of two ranges of columns, either of stone or composition, and of a pyramidical form, having large semi-globes placed on their tops, with their surfaces upwards.

" If these structures are really of stone, which I imagine them to be, it is astonishing how a rude and uncivilized people, unacquainted with any of the arts necessary for the purpose, and without proper tools, could have formed

and

and erected them*. We measured one of the pillars, and its semi-globe or capital, the dimensions of which were as follow:

	Feet	Inches.
Perpendicular height of the pyramid	14	0
Breadth at the base	5	4
Diameter of the semi-globe	5	10

"Having got on board a sufficient stock of wood, and filled our empty water-casks, we got under way in the evening, and stood to the westward. The thermometer, while we lay in the road of TINIAN, kept, with little variation, at 83°; but the heat was considerably more intense on shore."

It has been seen (page 47, note * of this Vol.) that ANSON's historian was of opinion that the pillars and massive semi-globes by which they are surmounted, were formed of sand and stone cemented together, and covered with plaster: MORTIMER thought them of stone or composition. BYRON who caused the Island of SAYPAN to be visited, in 1765, tells us, that there were seen on it "many of those square pyramidal pillars which are to be found at TINIAN, "and which are particularly described in the account of Lord ANSON's "voyage;" but he does not say whether he himself saw any of them at TINIAN: in voyages more recent than that of BYRON, no mention is made of the monuments of the latter island; and this silence had led me to conclude that time had destroyed them. But it is seen, by the detail into which MORTIMER has entered, that they were still standing at the end of December 1739; and

* We are less astonished at the circumstances, when we are acquainted with the *colossal statues* which the inhabitants of *Easter* Isle, full as destitute of implements and tools as those of *Tinian* could be, have erected, in ancient times, on the circumference of their island. (*See* the Voyage of the Dutch Admiral *Roggeween*.—*See* also *Cook*'s Second Voyage.—*La Pérouse*'s Voyage, &c.)

forty-ſeven years which had elapſed between ANSON's voyage and that of Cox, appeared not to have affected them, which may be conſidered as ſurpriſing in works expoſed to the injuries of the air, to heavy rains, and to exceſſive heats: it muſt be imagined that their conſtruction was ſolid, and that excellent materials were employed in it; for it is well known that, when ANSON ſaw them for the firſt time, the Spaniards already regarded them as monuments of great antiquity.

Paris, 25 Floreal, year VII of the French Era. (14th May 1799.)

RESULTS

RESULTS OF THE OBSERVATIONS

FOR THE

LATITUDE AND LONGITUDE,

Made on board the ſhip SOLIDE, *in the courſe of her Voyage round the World, ſerving to determine the changes occaſioned by the Currents in the apparent courſe and rate of ſailing of the ſhip, in the different tracts of ſea which ſhe croſſed, as well as the error in the calculation of the dead reckoning in the interval of the obſervations, and at the period of each land-fall.*

THE numerous obſervations for the latitude and longitude made on board the SOLIDE, in her Voyage round the World, have furniſhed me with the *data* neceſſary for eſtimating, with a correctneſs ſufficient for the information of navigators, the effect which the ſhip experienced from the currents in the different tracts of ſea that ſhe croſſed. I have thought that this effect might be known, at leaſt by approximation, if the progreſs in latitude and longitude, ſuch as it was announced by the reſults of the aſtronomical obſervations, was compared with the progreſs for the ſame intervals, ſuch as it was deduced from the ordinary calculation of the ſhip's run; and I have ſuppoſed that all the errors of the *dead reckoning*, indicated by the reſults of theſe compariſons, ought to be attributed to the unperceived action of the

the currents which had driven the ſhip out of her apparent courſe, and occaſioned her to make, in a direction different from that ſhe had appeared to follow, a progreſs, which, by the uſual methods of keeping a reckoning, could not be eſtimated, either as to its length, or as to the degree of velocity with which it had been effected.

But, in order to admit that this ſuppoſition has conducted me to true reſults, two others muſt likewiſe be admitted: the former, that the errors of the dead reckoning depended ſolely on the effect of the currents; the latter, that the obſervations of the moon's diſtance from the ſun or ſtars, gave reſults ſufficiently certain for us to be able to deduce from them, as from fixed points, the reſults of the calculations of the dead reckoning. I do not therefore preſent, as ſtrictly correct determinations, thoſe which are founded on theſe ſuppoſitions; and it muſt not thence be concluded that the direction and degree of velocity impreſſed on the ſhip, in each tract of ſea, by the action of the currents, were *ſtrictly* thoſe given me by the reſults of my calculations: ſtill leſs muſt it be expected that, at all times, in the ſame tract of ſea they will again be found the ſame. But my labour will indicate to navigators what uſeful employment they can make of lunar obſervations, for the purpoſe of improving this branch of hydrography, which, hitherto, has been too much neglected: for, if on the one hand, from the want of preciſion in the obſervations, and on the other, from the uncertainty of the dead reckoning, the errors of which may not always ariſe from the ſole action of the currents, the determinations of the effect of the movement of the waters on the ſhip's courſe, ſuch as I have deduced them, do not preſent themſelves with the confidence of geometrical exactneſs, they may at leaſt be conſidered as approximations, which cannot be very wide of the truth; and in their ſtate of imperfection, they will ſtill be of great utility to ſhips

that ſhall traverſe the tracts of ſea which the SOLIDE croſſed in her circumnavigation of the globe*.

It will be remarked that, in general, in the parts of the ATLANTIC OCEAN and of the GREAT OCEAN that the ſhip croſſed, the currents which ſet to the *Northward*, alſo ſet to the *Eaſtward*; while thoſe which ſet to the *Southward*, ſet at the ſame time to the *Weſtward:* but the quantities with which they act in the direction of the latitude and in that of the longitude, are neither equal in themſelves, nor conſtant; whence reſult degrees of velocity which differ more or leſs, and directions, which make angles more or leſs open with the Meridians or with the Parallels. When the directions, which at the ſame time partake of *Northing* and *Eaſting*, or of *Southing* and *Weſting*, ceaſe to have place, this change appears to be owing to the particular diſ-

* The lunar method not being able to give the longitude at ſea without an uncertainty of about half a degree, a preciſion ſufficient when the queſtion is to make the land after a long voyage, it cannot indicate with a preciſion of which we are certain, little differences of meridian; becauſe the error of one of the two obſervations, the compared reſults of which indicate the progreſs in longitude, may ſometimes exceed theſe little differences, and even indicate them in a direction contrary to the true one. This is not the caſe with the determinations which are obtained from aſtronomical watches and clocks, from *time-keepers* or *chronometers:* the ſmaller are the intervals of time, the greater is the preciſion of the reſult; becauſe, in a ſmall interval, the time-keeper has more certainly preſerved the regularity of its rate of going.

We cannot too ſtrongly recommend to navigators to blend the two methods; they will lend to each other mutual aid; the time-keepers will correct the reſults of the lunar obſervations, when it is required, in the courſe of a ſhip's run, to determine the little progreſſes in longitude, and to aſcertain what has been the daily influence of the currents on the veſſel's courſe; but, when drawing near the end of a long paſſage, it is of importance to know with certainty the true poſition of the ſhip with reſpect to the place where it is wiſhed to make the land, the reſults of repeated lunar obſervations, compared with thoſe given by the chronometer at the ſame periods, will ſhew whether the latter have not experienced ſome conſiderable derangement in its rate; and ſhould there be found, between the two reſults, a difference which might exceed a degree, as it would not entirely belong to the error of the lunar obſervations, a mean ſhould be adopted between the two reſults, in order to have a determination according to which the navigator might direct his courſe with ſafety.

poſition and configuration of lands not far diſtant from the ſhip's track, to gulfs, to channels or mouths of great rivers, which occaſion accidental and extraordinary currents, the effect of which the navigator ceaſes to feel as ſoon as he has paſſed the ſpace of ſea to which their action is limited; and he ſoon finds again the general current, that which reigns in the offing, whoſe effect it is, no doubt, leſs difficult to determine on a ſhip which it maſters, than to aſſign its cauſe.

If, at a future period, after the obſervations which navigators will find means to multiply for the advancement of ſcience and for their own intereſt, we ſhould happen to be convinced, that, in the parts of the two Oceans, croſſed by the SOLIDE's track, the currents which carry a ſhip to the *Northward* carry her conſtantly to the *Eaſtward*, and that thoſe which carry her to the *Southward*, carry her at the ſame time to the *Weſtward*, this certainty would afford a mean of guarding, in part, againſt the errors in the dead reckoning towards the *Eaſt* or the *Weſt*, on ſuch days as the ſtate of the weather ſhould not allow of making obſervations of the moon's diſtance from the ſun or ſtars, or of having recourſe to a time-keeper for determining the longitude: for if, by ſome one of thoſe methods of which ſeamen are at this day in poſſeſſion, the true latitude of the ſhip can be known, the difference between her real progreſs in the interval from one day of obſervation to the other, and the progreſs indicated by the dead reckoning for the ſame interval, will ſhew how much, and on what ſide, in the direction of the latitude, the ſhip has been driven out of her apparent courſe; and thence will be deduced, if not how much, at leaſt on what ſide, ſhe muſt have been deranged in the direction of the longitude: as to the quantity of this derangement, it may be preſumed from the reſults of the obſervations that have been made on the preceding days in the tract of ſea the neareſt to that in which the ſhip is ſailing.

But

But this apparent uniformity in the currents, this movement, which, in the SOLIDE's voyage, prefents to us fo few variations, muft not, however, be confidered as invariable: a long feries of obfervations can alone inform us how far, in what tracts of fea, and in what feafon, we may be permitted to confider it as nearly conftant.

I have comprifed in one Table, which terminates thefe *NOTES*, the refults of all the calculations relative to the action of the currents, whofe effect the SOLIDE experienced in the courfe of her Voyage round the World; and I am perfuaded that thofe feamen who fhall fix their attention on this Table, will wifh that every navigator may affiduoufly employ himfelf in fuch obfervations as may, on his return from his voyage, furnifh us with one fimilar: hydrographers who had before them this feries of Tables, would there find the *data* neceffary for conftructing charts, in which might be fpecified in every tract of fea, the ordinary direction and ftrength of the currents; I fay *ordinary*; for they may experience derangements in their direction and velocity, from the effect of accidental and unknown caufes: and, perhaps, they even experience periodical changes: but if the changes be regular, it will be fufficient, in order to fucceed one of thefe days in afcertaining the law by which they are governed, to have a feries of obfervations made in the fame tracts of fea in different feafons. Let navigators but multiply their obfervations, time and men of fcience will do the reft.

The precifion with which the SOLIDE made all her land-falls, by regulating her courfe according to the refult of the obfervations for the longitude, fhews the degree of confidence that we may grant to the determinations of the *effects of the currents*, which has been deduced from thefe very obfervations in the courfe of the different runs. The precifion of the land-falls proves, at the fame time, what fafety the methods which may be employed for de-

 termining

termining the longitude afford to navigators. Their advantage cannot fail to be appreciated, if, at every period in which the ſhip touches at places whoſe geographical ſituation is determined, we compare the reſult of the obſervations with that which would have been given by the ordinary calculation of the dead reckoning; and I ſhall take care to place this compariſon before the eyes of the reader at the end of each run: may it make our navigators ſenſible that the *dead reckoning* is no more than a ſubſidiary method, of which it is no longer allowable to make uſe but as a proviſional ſupplement, and merely when it is not poſſible to find in the heavens, by the obſervation of the ſun, moon, and ſtars, the poſition in which the ſhip muſt be on the globe!

FIRST RUN.

From the Strait of GIBRALTAR to the CAPE DE VERD Iſlands.

NOTE I*.

On the 29th of December 1790, at eight o'clock in the evening, Cape Spartel (on the Coaſt of Africa) when the ſhip had cleared the Strait of Gibraltar, bore directly ſouth†, diſtant $1\frac{2}{3}$ leagues.

* In the *Journal of the Route*, on the days ſpecified, will be found the elements of the calculations and reſults which theſe *Notes* preſent.

† In all the points of the compaſs mentioned in theſe *Notes*, allowance is made for the variation of the magnetic needle, and they are reduced to the true north, unleſs it be expreſsly mentioned to the contrary.

The

The obſervations of BORDA, in 1776, have fixed the latitude of this cape at 35° 47′ 20″ north, and its longitude at 8° 14′ weſt from PARIS*.

Thus, the SOLIDE, in taking her departure from the bearing taken at eight o'clock, ſailed from the latitude of 35° 52″ 20″, and longitude of 8° 14′.

NOTE II.

On the 5th of January 1791, at three quarters paſt one o'clock in the afternoon, Captain MARCHAND got ſight of the Peak of TENERIFFE; and it bore ſouth 6° 30′ eaſt, at the diſtance of thirty-five leagues eſtimated by the eye.

From noon to three quarters paſt one, the ſhip had run 8 miles weſt ſouth-weſt 6° 30′ ſouth.

Conſequently, her latitude had diminiſhed ſince noon, nearly 4 minutes, and her longitude had increaſed about 8 minutes.

The latitude obſerved at noon was 30° 8′: that of the Peak is 28° 17′: thus at this period, the ſhip was more to the northward than the Peak by 1° 51′.

At three quarters paſt one, this difference had diminiſhed 4 minutes; conſequently, the ſhip was then only 1° 47′ to the northward of the Peak.

In this ſituation, the Peak bore ſouth 6° 30′ eaſt: the ſhip was therefore 12 miles, or about 14 minutes, more to the weſtward than the Peak.

* Theſe determinations are taken from a Manuſcript communicated by *Borda*.

The

The longitude of the Peak, reduced by the operations of BORDA*, to that of the town of SANTA CRUZ, is 19°: thus that of the ſhip was 19° 14′.

And if it be wiſhed to reduce it to noon, the 8 minutes progreſs to the weſtward, from that time to three quarters paſt one muſt be deducted, and it will then be no more than 19° 6′.

Let us at preſent compare this laſt-mentioned longitude with that of the point of departure, on the 29th of December, to the northward of Cape SPARTEL, 8° 14′; we ſhall ſee that the real progreſs towards the weſt, from the 29th of December to the 5th of January (in ſeven days wanting 8 hours) was 10° 52′; but, according to the dead reckoning, her apparent progreſs is 11° 32′; thus, from the effect of ſome current, the ſhip was carried two-thirds of a degree towards the eaſt, or (reducing the parts of the equator into marine miles, on a mean parallel between the two extreme parallels) 38 miles leſs towards the weſt than the reckoning indicated; which gives for the mean effect of the current towards the eaſt, $5\frac{1}{2}$ miles in twenty-four hours.

* The longitude of the town of *Santa Cruz* (at the Mole), reduced to that of the obſervatory at *Cadiz*, is fixed at 18° 36′ weſt from *Paris*, by a mean between the determinations given by the time-keepers of *Ferdinand Berthoud*, on board the *Iſis*, in 1769 (*Pingré* and *Fleurieu*) on board the *Flora*, in 1771, (*Verdun*, *Borda* and *Pingré*) on board the *Bouſſole*, in 1776 (*Borda*): and ſeveral obſervations of the eclipſes of Jupiter's Satellites, made, in 1774, by Father *Feuillée* (*Mém. de l'Acad. des Sciences*, 1776, page 135 to 146) and in theſe latter times by *Varela* (*Borda's MSS.*) and the correſpondent ones of which have been had in the obſervatories of *Europe*, confirm this determination. Its latitude has been fixed by a great number of obſervations at 28° 28′ 30″ north.

The latitude and longitude of the Peak of *Teneriffe* were reduced to that of *Santa Cruz* by the operations of *Borda*, whoſe name is a ſufficient voucher for the exactneſs of the operations and reſults: he has determined its latitude at 28° 17′ north, and its longitude at 19° weſt from *Paris*. (*MSS.* communicated by *Borda*).

In comparing daily the latitudes obſerved with thoſe which were deduced from the dead reckoning, it will be found that the ſhip was drifted by the currents, ſometimes towards the ſouth, ſometimes towards the north, and, allowing for the quantities in contrary directions which do away each other, ſhe was carried 9 minutes, or 9 miles, towards the ſouth: in combining them with the 38 miles eaſting, we have for the imperceptible movement of the ſhip, 39 miles to the eaſt 13° 30′ ſouth, and for the mean drift per day in that direction 5.8 miles: but it may be preſumed that her progreſs towards the eaſt was conſtant, as it ſhould be, according to the remark of all the navigators who have experienced that the waters of the OCEAN ſet with a rather conſiderable velocity towards the Strait of GIBRALTAR, through which they run into the MEDITERRANEAN, whoſe receipt from the rivers which diſcharge themſelves into it, does not compenſate for the expenditure that is made by evaporation *.

I ſhall here make a remark acceſſory to the object of this NOTE.

The

* In a run which I made in 1769, from *Cadiz* to the Iſland of *Teneriffe*, by a direct courſe and with a ſteady breeze from north-eaſt to eaſt-north-eaſt, I had an opportunity of aſcertaining the conſtant effect of the current which ſets to the eaſtward as long as a ſhip ſails in the tract of ſea ſituated to the weſtward of the Strait of *Gibraltar*, and at a little diſtance from it. Clear weather permitted me, during the four days employed in this run, to take daily obſervations for determining the longitude of the ſhip by the help of the time-keepers of *Ferdinand Berthoud*, of which I had been ordered to make a trial, and whoſe daily rate had been aſcertained at *Cadiz*; and in comparing, every day, the ſhip's progreſs towards the weſt deduced from the obſervations, with that indicated by the dead reckoning, I had the following reſults.

On the 1ſt day, the current had ſet to the eaſtward, $11\frac{1}{4}'$; on the 2nd, $12\frac{3}{4}'$; on the 3rd, $9\frac{1}{3}'$; on the 4th, $1'$.

It is ſeen that, during the firſt three days, the movement impreſſed on the ſhip to the eaſtward, carried her towards that ſide, $33\frac{1}{3}'$ or $27\frac{3}{4}$ miles, and by a mean, about 8 miles in twenty-four hours.

But

The latitude obſerved, at noon, was 30° 8 : from noon to three quarters paſt one, the period at which a bearing was taken of the Peak, the ſhip's progreſs had been 4 minutes towards the ſouth; thus, at three quarters paſt one, the latitude was no more than 30° 4′: and it was more northerly than the Peak, by 1° 47′ or 35⅔ leagues. Captain MARCHAND had eſtimated by the eye that the diſtance might be 35 leagues: and the obſervation of latitude proves that the real diſtance differed very little from this eſtimation: it proves too, and this is what I wiſh to conclude from it, that in coming from the northward, as from every other part of the horizon, the PEAK OF TENERIFFE may be diſtinguiſhed at the diſtance of 35 or 36 leagues, even when the weather is not perfectly clear: for we ſee, in the JOURNAL OF THE ROUTE, that, from noon of the 5th to noon on the 6th, the wind was to the northward, variable, and faint; and the weather *hazy*. Thus, when the bearing of the Peak was taken at three quarters paſt one on this latter day, the weather could not be perfectly clear; but it had been ſufficiently ſo for taking the meridian altitude of the ſun, and it was ſufficiently ſo for the Peak to be perceived at the diſtance of thirty-five leagues, becauſe its ſummit was not enveloped in clouds, but towered above them. In calculating from its elevation above the level of the ſea, which the operations of BORDA, made in 1776, in his excurſion to the loftieſt point of the mountain, have fixed at

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But the action of the current ceaſed to be felt on the 4th day when the ſhip had reached the parallel of 31°: (See the *Voyage de l'Iſis, en* 1768 *et* 1769, *à differentes parties du Monde, pour éprouver les Horloges marines, &c. Paris Imprim. Rle.* Vol. I. page 279.)

The quantities which the ſhip had been carried, in the ſame interval, towards the ſouth or towards the north, had nearly counterbalanced each other: 8⅔′ to the ſouthward, 6⅛′ to the northward. (See *Ibid.* Vol. II. page 290.)

1905 toiſes *, we find that the diſtance at which the Peak is ſeen geometrically in a line with the horizon, regard being had to terreſtrial refraction, is $128\frac{3}{4}$ minutes of a degree, or about 43 marine leagues: and if we ſuppoſe the eye raiſed from 20 to 25 feet above the level of the ſea, this diſtance may be increaſed 2 or 3 leagues. But the upper part of the mountain, or the *Piton*, forms a truncated cone on an elevation of 500 feet; and the eliptical mouth of the crater which terminates it, and into which Borda deſcended, is not more than from 35 to 40 toiſes in length in its great diameter, which inclines towards the ſouth-ſouth-eaſt, and from 25 to 30 only in its ſmall diameter: it may therefore be preſumed that the mountain of the Peak is not eaſily diſtinguiſhed in the horizon, except when the baſe of the *Piton* begins to make its appearance there; therefore it may be admitted that the greateſt diſtance at which the Peak of Teneriffe can be perceived from a ſhip's deck, is 42 or 43 leagues: I ſay nothing of the little differences which depend on the variation of terreſtrial refractions, which varying according to the temperature and the ſtate of the atmoſphere, change the apparent height of mountains.

According to theſe meaſures which no one will conteſt, we may judge how greatly voyagers have exaggerated, who have told us that they had perceived the Peak of Teneriffe *ſixty* and a *hundred* leagues off at ſea †.

* Two barometers were placed on the higheſt edge of the crater; the one roſe to 18 inches, the other to $18\frac{4}{10}$ lines, *Reaumur's* Thermometer to $8\frac{1}{2}$ degrees above the freezing point. On comparing theſe quantities to thoſe which the barometers of compariſon had riſen, at the ſame hour, at the ſea-ſide, and on applying, for the corrections to be made, the rule of *M. de Luc*, we find the height of the peak above the level of the ocean, to be 1929 toiſes. The trigonometrical meaſure, taken with all the precautions that could inſure its exactneſs, gave 1905 toiſes; and it is ſeen that the height indicated by the barometer differs from the true only by 24 toiſes. (Theſe meaſures are taken from a Manuſcript communicated by *Borda*.)

† See the *Hiſtoire générale des Voyages* by *Prévoſt*, Vol. II. page 239, 4to. edition.

NOTE

NOTE III.

In comparing the longitude given by two ſets of diſtances of the ſun and moon, obſerved on the 9th, at three quarters paſt three o'clock in the afternoon, and reduced to noon of that day, with that which had been deduced, on the 5th, from the bearing of the PEAK OF TENERIFFE, it is ſeen that, in the interval of four days, the progreſs towards the weſt, had been 2° 40′. In reducing, in like manner, to the bearing of the PEAK the longitude given by the dead reckoning on the 9th at noon, it will be found that the progreſs indicated by the reckoning, from the 5th to the 9th of the month, was 3° 34′: thus, the ſhip had again been carried towards the eaſt 54 minutes, or about 49 miles, on the mean parallel between the two extremes.

The obſervations of latitude ſhewed that, in the ſame interval, ſhe had been carried 12 minutes, or 12 miles, to the ſouthward, beyond the ſum of the progreſs by account.

It thence reſults that the currents had ſet her $50\frac{1}{2}$ miles to the eaſt 13° 45′ ſouth, at a mean rate of $12\frac{2}{3}$ in twenty-four hours.

It is very uſual, in the ſeas which the SOLIDE had croſſed, for ſhips to be carried to the eaſtward by the movement of the waters: and, moſt commonly, they are at the ſame time carried to the ſouthward.

NOTE IV.

On the 14th, at noon, the ſouth point of MAYO, one of the CAPE DE VERD Iſlands, bore north, diſtant one league.

By

By a mean between the results of the observations which were made on board the Isis, in 1769, and on board the Flore, in 1771, the latitude of this point is 15° 4′ 30″ north, and its longitude 25° 28′ 30″ west *.

The ship's place whence the bearings were taken at noon was on the very meridian of this point, and 3 minutes more southerly; thus, at that period, the latitude of the ship should be 15° 1′ 30″, and that which was observed was conformable to it: her longitude was that of the south point of Mayo, 25° 28′ 30″.

On comparing this longitude with that which had been observed on the 9th at noon, we find that, in the interval of five days, the ship's progress towards the west was 3° 42′ 30″. According to the dead reckoning, it ought to be only 3° 9′: thus the ship was carried to the westward 33½ minutes, or 30½ miles (reducing the parts of the equator into marine miles by a mean parallel.)

The observations of latitude shewed that, in the same space of time, she was drifted to the southward, 18 minutes, or 18 miles: thus, through the effect of the current, the ship was carried 35½ miles to the west 30° 45′ south, at a mean rate of 7.1 miles in twenty-four hours.

The longitude by account, such as it was given by the dead reckoning deduced from the longitude of the point of departure, on the 29th of December within sight of Cape Spartel, was 26° 29′: and in comparing it to the true longitude, 25° 28′ 30″, we find that the error of the reckoning, at

	Lat. north.		Long. west.	
* According to the observations made on board the *Isis*	15°	3′	25°	27′
According to those made on board the *Flore*	15	6	25	30
Mean	15	4½	25	28½

the

the expiration of ſixteen days, was, *ahead* of the ſhip, 1 degree, which, on the parallel of the point arrived at, is equal to 58 miles. But it has been ſeen that a compenſation had taken place in the errors: in the interval from the 29th of December to the 9th of January, the ſum of the errors in the reckoning, *ahead* of the ſhip, had been 87 miles or 1° 34′; and from the 9th to the 14th, the error was 30.5 miles or 0° 34′ *aſtern*.

SECOND RUN.

From the CAPE DE VERD Iſlands to within ſight of STATEN LAND.

NOTE V.

The longitude of La Praya, in the Iſland of St. Jago, was determined by the obſervations made with the help of the time-pieces of Ferdinand Berthoud, in 1769 on board the Isis; in 1771, on board the Flore, and reduced to the longitude of Cadiz*: it is 25° 21′ weſt from Paris.

It is from this point that the Solide ſailed, on the 18th of January, in order to get under the meridian of Staten Land, which Captain Marchand

		Lat. North.	Long. Weſt.
* *La Praya*	Obſerv. on board the *Iſis*	14° 52′ 33″	25° 50′ 00″
	Obſerv. on board the *Flore*	14 43 40	25 51 30
	Mean	14 53 06.5	25 50 45

intended

intended to make before he entered into the GREAT OCEAN, becauſe it was poſſible, as really happened, that the contrariety of the winds might not permit him to get ſight of Cape HORN.

No obſervation of longitude could be taken till the 6th of February: but the reſults of the obſervations of latitude compared to thoſe of the reckoning ſhewed that, in the interval from the 28th to the 31ſt of January, the ſhip was carried to the northward 50 minutes beyond the run by account, that is, 16½ miles in twenty-four hours.

This great effect of a current coming from the ſouthward took place between the parallel of 3° 36′ and that of 2° 26′ north, and between 20° 35′ and 21° 29′ weſt longitude. From the time of the departure being taken from LA PRAYA to this period, very inconſiderable differences only had been remarked between the latitudes by account and the latitudes by obſervation: during the firſt three days, there had been no difference: from the 21ſt to the 22nd, the ſhip appeared to have been carried by the movement of the waters, 4 minutes to the ſouthward; but on the following days, ſhe appeared to be ſet to the northward: from the 22d to the 23d, 3 minutes; from the 23d to the 24th, 4 minutes, and from the 24th to the 28th, 1 minute only.

If the reader will caſt his eye on the chart of the ATLANTIC OCEAN, he will ſee that, in the interval from the 28th to the 31ſt of January, during which the ſhip experienced the effect of a ſtrong ſoutherly current, ſhe was ſailing in the part of that ocean where the waters are confined between the two continents. It is well known that, on the coaſt of BRAZIL and GUIANA, from Cape ST. ROQUE to the ANTILLES, the waters have a conſtant movement from the ſouth to the north, declining more or leſs towards the weſt, according to the direction of the land.

As no obſervations were made for the longitude ſince the time of the departure being taken from La Praya, it cannot be known whether the current which ſet to the northward, ſet at the ſame time to the eaſtward or weſtward; it might be preſumed that its direction was rather towards this latter ſide, firſt, becauſe it is well known that the waters, between the tropics, have a general tendency from eaſt to weſt, and in the ſecond place, becauſe the obſervations which were made on the 6th of February following, indicated that, in the interval from the 18th of January to this latter day, the ſhip's progreſs towards the weſt had been greater by 1° 3′, or about 21 leagues, than that which was deduced from the dead reckoning.

NOTE VI.

The mean reſult of four ſets of diſtances of the ſun and moon, obſerved on the 6th of February, at forty-ſeven minutes paſt four o'clock in the afternoon and reduced to noon, gave for the longitude of the ſhip at that moment, 27° 58′; and, on comparing it to that of La Praya 25° 51′, it was found that, from the 18th of January to the 6th of February, in nineteen days, the ſhip's progreſs towards the weſt had been 2° 27′.

According to the dead reckoning, it had been only 1° 4′; thus the ſhip had been carried to the weſtward, beyond the progreſs by account, 1° 3′, or 62 miles.

On comparing the ſum of the progreſs in latitude deduced from obſervation, with that of the progreſs by account, it will be found that from the 18th of January to the 5th of February, the ſhip had been carried to the northward,

ward, 1° 34′, which are reduced to 1° 30′, becauſe, from the 21ſt to the 22d ſhe had been carried 4 minutes to the ſouthward; and as from the 5th to the 6th of February, ſhe had been alſo ſet to the ſouthward, 9 minutes, her relative movement towards the north, in the interval from the 18th of January to the 6th of February, is reduced to 1° 21′ or 81 miles.

Thus, after having combined the progreſs in latitude with that which was made in longitude, it is ſeen that the ſhip was carried to the north 37° weſt, 103 miles in nineteen days; which gives a mean progreſs of 5.4 miles in twenty-four hours in that direction.

NOTE VII.

Freſh obſervations for the longitude made on the 7th, 8th, and 9th; namely; on the firſt day, two ſets of diſtances of the ſun and moon; on the ſecond, two others; on the third, two more, gave for each of the days, a reſult which was reduced to their reſpective noon.

On comparing the progreſs towards the weſt in twenty-four hours, deduced from the obſervations, with that indicated by the dead reckoning, the following differences were found:

From the 6th to the 7th, the progreſs by obſervation was greater than that by account, by 8 minutes;

From the 7th to the 8th, leſs by 1 minute;

From the 8th to the 9th, greater by 23 minutes;

And

And in comprifing the three days, from the 6th to the 9th, the progrefs towards the weft was greater, according to the obfervation than according to the dead reckoning, by 30 minutes, or 29¾ miles.

The progrefs towards the fouth, from the 6th to the 9th, was, daily, greater by obfervation than by account, by 3 minutes, and 9 minutes, or nine miles, for the three days.

Thus, in that interval, the fhip was carried 31 miles to the weft 28° fouth; which gives a mean movement of 10⅓ miles in twenty-four hours in this direction.

If, on the 9th the abfolute longitude by obfervation, 31° 8′, be compared with the longitude deduced from the dead reckoning, which is 29° 35′ in reducing the calculations to the longitude of La Praya, it is feen that after twenty-two days' navigation, the accumulated errors in the reckoning produced one of 1° 33′, or upwards of thirty leagues, *aftern* of the fhip's true fituation.

NOTE VIII.

On the 12th, at nineteen minutes after four in the afternoon, four diftances were taken of the fun and moon, and, at night, a fet from the moon to β of *Pollux*. The mean between the five refults, reduced to noon, gives for the longitude of the fhip at that moment, 33° 41′; and in deducting the latter from that of the 9th at noon, there remain 2° 33′ for the fhip's progrefs towards the weft, in the interval of the three days.

This

This progreſs, according to the dead reckoning was only 2° 11′; thus, the ſhip was carried to the weſtward 23 minutes, or 21.4 miles.

In the ſame interval, ſhe had been carried to the ſouthward 24 minutes, or 24 miles.

On combining the movement, we find 32.2 miles to the weſt 48½° ſouth; and for the mean drift in twenty-four hours, 10¾ miles.

At the period of the 12th, the dead reckoning was in error reſpecting the longitude, 1° 55′, or about 37 leagues *aſtern*.

NOTE IX.

The mean reſult of two ſets of diſtances obſerved from the moon to *Regulus*, and from the moon to *Aldebaran*, on the 15th, at half paſt eight o'clock in the evening, and reduced to noon of that day, ſhewed that, ſince the 12th, the ſhip's progreſs towards the weſt had been 2° 15′, but it was only 1° 42′, according to the dead reckoning: thus, the ſhip had been carried to the weſtward 33 minutes, or 31.5 miles.

In the ſame interval, according to the obſervations of latitude, ſhe had been carried 29 minutes, or 29 miles, to the ſouthward, beyond her progreſs by account towards that ſide.

On combining theſe two movements, we find that the compound movement was 42.9, miles to the weſt 42° 30′ ſouth, and the mean drift, 143 miles in twenty-four hours,

NOTE X.

Freſh obſervations made on the 16th, at nine o'clock in the evening (two ſets of diſtances from the moon to *Aldebaran*, and one to *Regulus)*, gave for the longitude reduced to noon, 37° 6′; and conſequently, 1° 10′, for the progreſs towards the weſt, from the 15th to the 16th.

According to the dead reckoning, this progreſs was only 44 minutes: thus, in twenty-four hours, the ſhip was carried to the weſtward, 26 minutes, or 24.5 miles.

According to the obſervation of latitude, ſhe was at the ſame time carried to the ſouthward 10 minutes, or 10 miles.

The compound movement was therefore 26.5 miles to the weſt, 22° 30 ſouth.

It is ſeen that, in theſe twenty-four hours, the movement towards the weſt differs greatly, in regard to the movement towards the ſouth, from the agreement that had been remarked during the preceding periods. This difernce may be owing to the variation which the current had experienced in its direction and velocity; but it is more probable that it is occaſioned by the error in the obſervations in one of the two days, or perhaps an error in both: it is well known that the *Lunar Method* cannot aſſign with ſufficient preciſion ſmall differences in longitude for the reſults that are deduced from them to be, in that caſe, conſidered as fixed terms of compariſon*.

On

* I obſerve that the effect of the current towards the ſouth, was, from the 12th to the 13th, 5 minutes; from the 13th to the 14th, 10′; from the 14th to the 15th, 14′; from the 15th to the 16th,

NOTE XI.

On the 25th, ſix ſets of diſtances of the ſun and moon, obſerved at ſeven o'clock in the morning, gave for the longitude at noon, 47° 56′: by thoſe of the 16th, at noon, it had been 37° 6′: thus the progreſs towards the weſt, according to the obſervations, had, in nine days, been 10° 50′.

Acccording to the dead reckoning, it was only 9° 5′; and thence it was concluded that, in the interval, the ſhip had been carried to the weſtward 1° 45′, or 94¼ miles, beyond the apparent run.

The ſhip's movement towards the ſouth, beyond the progreſs indicated by the dead reckoning, had been conſiderable during this period; according to the daily obſervations of latitude, it had amounted to 20 minutes, from the 17th to the 18th; to 14 minutes, from the 22d to the 23d; to 20 minutes, from the 23d to the 25th. The ſum of theſe differences, relatively to the dead reckoning, was 1° 7′, or 67 miles, which ſhe had been carried to the ſouthward.

The combination of theſe movements for which the dead reckoning had not been able to account, towards the ſouth and towards the weſt, gives

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16th, 10′: its effect in the direction of the latitude therefore experienced no great variations, eſpecially during theſe laſt-mentioned days; and it might be ſuppoſed that the effect towards the weſt did not proportionably undergo more conſiderable ones. We would then ſay: if, from the 12th to the 15th, with a total effect towards the ſouth of 29′, the ſhip experienced an effect towards the weſt of 33′; with an effect of 10′ towards the ſouth, what muſt have been the effect towards the weſt? We ſhould find that the laſt term of this proportion is 11⅓ minutes, which muſt be added to 44 minutes, the ſhip's progreſs towards the weſt, according to the dead reckoning, from the 15th to the 16th: we ſhall have 54⅓ minutes for the preſumed progreſs, ſmaller by 14 or 15 minutes than that indicated by the obſervations.

115⅔ miles to the weſt 36° ſouth: and the ſhip had been carried in that direction at the mean rate of 12.8 miles in the twenty-four hours.

Obſervations for the longitude, made on the 26th (ſix ſets of diſtances of the ſun and moon, at eight o'clock in the morning), announced that, in the interval from the 25th to the 26th, the calculation of the dead reckoning agreed with the reſult of the obſervations.

But the obſervation of latitude ſhewed that, in the ſame interval, the ſhip had been carried 22 minutes to the ſouthward.

At the period of the 26th, the longitude by account, deduced from that of La Praya, at the expiration of thirty-nine days, was *aſtern* of that given by the obſervations, 4° 39, or upwards of 78 leagues on the parallel of the point arrived at.

It may have been remarked that, from the 6th of February, the period at which the ſhip, having arrived at 5° 30′ ſouth of the line, had paſſed beyond the parallel of Cape St. Roque, whence the eaſtern coaſt of South-America begins to trend towards the ſouth-weſt, and extends in that direction as far as the Strait of Magellan, ſhe was conſtantly carried to the ſouth-weſt, declining ſometimes towards the weſt, ſometimes towards the ſouth, and with degrees of velocity which kept increaſing, in proportion as ſhe increaſed her latitude.

If it be wiſhed to aſcertain what was, in the interval of the laſt twenty days, from the 6th to the 26th of February, the total effect of the ſetting of the currents on the courſe and rate of ſailing of the ſhip, we may caſt up the ſum of the imperceptible progreſs towards the weſt, and of that to-

wards the ſouth, which the reſult of the obſervations indicated at different periods; it will be ſeen that the ſhip was driven out of her apparent courſe, 161 miles (2° 41′) towards the ſouth; and 201.3 miles (3° 47) towards the weſt; and on combining theſe two movements, it will be found that the unperceived mean movement of which theſe were no more than the decompoſition, was 266.6 miles to the ſouth-weſt 7° 45′ weſt: which implies a mean drift, relatively to the duration of the period, of 13⅓ miles, in twenty-four hours in that mean direction.

NOTE XII.

The mean reſult of four ſets of diſtances of the ſun and moon, obſerved on the 8th of March, at fifty-two minutes paſt three o'clock in the afternoon, and reduced to noon of that day, gave for the longitude of the ſhip, 48° 6′; and on comparing it with that which had been obtained on the 26th of February by ſix ſets of ſimilar obſervations, and which was 48° 23′ 30″, it will be found that, in the interval of ten days, the ſhip had *been driven back to the eaſtward*, 17½ minutes, or 14½ miles.

But, on decompoſing the different courſes which the ſhip had followed in this ſame ſpace of time; and on calculating according to the apparent degrees of velocity with which ſhe had run them, it will be ſeen that ſhe ought to have advanced 173 miles, or 3° 29′, to the weſtward; and this is the difference which is to be found between the longitude *by account* of the 26th of February, 43° 44′, and that of the 8th of March, 47° 13′.

The ſum of the apparent progreſs towards the weſt and of the real progreſs towards the eaſt (3° 40′ 30″, or 187.5 miles) is the difference be-

tween the refult of the obfervations made on the two extreme days of the period, and that of the calculations of the dead reckoning in the interval of the ten days.

The fhip's progrefs in latitude towards the fouth was, in the fame interval, according to the obfervations, 4° 18′, or 258 miles, and that which the dead reckoning would have given, would, by the accumulation of its daily errors, have been greater than the obferved progrefs, by 1° 20′, or 80 miles: but it was corrected by every obfervation of latitude; and the *true* latitude was daily employed as an element in the calculations of the dead reckoning.

If, with the real progrefs towards the fouth, 258 miles, and the eftimated or apparent progrefs towards the weft, 173 miles, if it be wifhed to afcertain what were the apparent courfe and rate of failing of the fhip, it will be found that fhe appeared to run 311 miles to the fouth 33° 45′ *weft*; while in reality, with the fame progrefs of 258 miles to the fouthward, and the progrefs by obfervation of 14½ miles to the eaftward, fhe advanced 258½ miles to the fouth 3° 15′ *eaft*.

Thus, the effect of the currents, in ten days, occafioned an error of 37° on the angle of the courfe.

It occafioned another error of 187½ miles (or 3° 46′ 30″) in the fhip's progrefs in longitude. This effect of the currents carried the fhip only 17½′, or 14½ miles to the eaftward of the pofition fhe was in on the firft day of the period; becaufe the action of the wind which drove her to the weftward, nearly balanced that of the body of the waters which carried her to the eaftward; and the 14½ miles exprefs the excefs of the ftrength of the current beyond

that of the wind, relatively to the progreſs in longitude; but its abſolute ſtrength, with reſpect to this ſame progreſs, or the error of the dead reckoning, is expreſſed by the whole of the 187 miles of difference between the ſum of the progreſs by account each day of the period, and the real progreſs deduced from the obſervations made on the firſt and laſt day.

It has been ſeen that, while the ſhip was carried to the eaſtward, ſhe was alſo carried to the northward, and that the ſum of the daily errors of the dead reckoning with reſpect to the progreſs in latitude, gives a total error of 1° 20′, or 80 miles in exceſs, towards the ſouth. If we combine the 80 miles which the ſhip was carried to the northward, with the 187½ miles which ſhe was carried to the eaſtward, it will be found that, by an unperceivèd effect which muſt have eſcaped the calculations of the dead reckoning, the ſetting of the currents had cauſed the ſhip to make, in the interval of ten days, 204 miles in the direction of eaſt 23° north. In dividing the number of miles by that of the days of the period, we ſhall have for the mean degree of velocity which the current impreſſed on the ſhip in twenty-four hours, 20′.4, or upwards of 6⅔ leagues.

Thus, the currents which, from the 6th of February, when the ſhip had reached the latitude of 5° 40′ ſouth, and the longitude of 28° weſt, till the 26th of the ſame month, when ſhe had arrived at the latitude of 32° 30′, and longitude of 48° 20′, had conſtantly ſet to the ſouthward and weſtward, from the latter day, ſet, with conſiderable ſtrength, to the northward and eaſtward.

Although, in the courſe of this period, the SOLIDE had ſometimes contrary and rather ſtrong winds, at other times calms, and almoſt always a ſwell which came from the weſt and ſouth-weſt; yet it is not ſolely to the difficulty

difficulty of correctly eſtimating the courſe and rate of ſailing of the ſhip in ſimilar circumſtances, that we may attribute the whole amount of the partial errors reſpecting the latitude, which the daily obſervations cauſed to be diſcovered, or the total error reſpecting the ſhip's progreſs in longitude, which the obſervations of the laſt day of this period brought to light. We muſt therefore ſeek another cauſe for theſe errors; and we find it if we caſt our eyes on the South Atlantic Ocean, and there ſet off the ſhip's place on the firſt and laſt day of this period.

On the 26th of February, in 32° 30′ ſouth latitude, the ſhip was in 48° 23′ 30″ weſt longitude, and on the 8th of March, in latitude 36° 48′, in 48° 6′ longitude: thus, in her route, ſhe had, within a few minutes, followed a meridian: ſhe had run 258½ miles to the ſouth 3° 30′ eaſt. The meridian on which the balanced effect of the wind and current had nearly kept her, is only about a hundred leagues diſtant from that of the vaſt mouth of the great River of La Plata, the middle of which is ſituated on the parallel of 35° 30′, and which occupies 1° 40′ in latitude, if we meaſure this mouth between Cape Antonio, to the ſouth, and Cape Santa Maria, to the north: now, from the 26th of February to the 8th of March, the ſhip had ſailed between the parallels of 32 and 37 degrees; ſhe therefore croſſed the ſtrength of the current whoſe effect, in iſſuing from the Rio de la Plata, extends, like that of the Marañon, or River of the Amazons, to a great diſtance at ſea; and as this current ſets to the eaſtward, declining towards the north, it is not aſtoniſhing that the ſhip ſhould have been carried in a direction analogous to that of the movement of the waters, and with a degree of velocity proportionate to that of the current, or rather to the exceſs of the ſtrength of the latter beyond that of the wind which drove the ſhip in an oppoſite direction.

It

It might be imagined that the ſtrength of the current for carrying the ſhip to the eaſtward, was greater on the laſt days of the period, than on the firſt, were we to judge by that with which ſhe was driven to the northward; for it may be ſeen in the JOURNAL OF THE ROUTE, that, from the 5th to the 7th of March, her progreſs in latitude, according to the dead reckoning, ought to have been no more than 12 minutes towards the north, and that, according to the obſervations it was 1° 4′, which proves that, in two days, the ſhip, by an imperceptible movement, had been carried 52 minutes, or 17⅓ leagues to the northward. But I remark that, on the 5th, the ſhip was, according to the obſervation of that day, in latitude 37° 39′, that is, about 1° 30′ more ſoutherly than the parallel of Cape SANT ANTONIO, the ſouth point of the mouth of the RIO DE LA PLATA; and that it is from this poſition that, in the interval from the 5th to the 7th, as was ſhewn by the obſervation of this latter day, that ſhe was carried by the movement of the waters, 52 minutes to the northward: which again placed her 25 minutes only to the ſouthward of the parallel of Cape SANT ANTONIO: ſhe had therefore paſſed beyond the parallels of the mouth of the river, when ſhe experienced this ſecond movement towards the north; and it is preſumable that the great effect of the current of the RIO DE LA PLATA for ſetting to the eaſtward, muſt be principally felt when a ſhip is croſſing the parallels between which its mouth is ſituated. This current towards the north might therefore be an accidental current, a conſequence of winds from the ſouthern quarter which had previouſly reigned, as the ſwell from the ſouth-weſt ſeemed to indicate.

But the effect of the accidental current ceaſed on the 8th; for the reſult of the obſervation of latitude on the 9th, compared with that of the dead reckoning, proved that, from the 8th to the 9th, the ſhip had been ſet to the ſouthward 26 minutes, or 8⅔ leagues, beyond the progreſs by account: and

and from the 10th to the 11th, the error in the ſame direction was 38 minutes, or 12⅔ leagues.

Let us at preſent examine how the longitude by account according to the calculation of the ſhip's run from La Praya, whence her departure was taken on the 18th of January, agreed, on the 8th of March, with the longitude deduced from the obſervations of that day.

It will be ſeen in the Journal of the Route, that the longitude by account which, on the 26th of February, was *aſtern* of the longitude by obſervation, 4° 39′, differs from it in the ſame direction, on the 8th of March, no more than 53 minutes. This approximation is the effect of the error of 3° 46′ *ahead*, which was committed in the dead reckoning in the interval from the 26th of February to the 8th of March; the diminution of the error is therefore the effect of a compenſation which the oppoſite currents effected without the knowledge of the navigator; but it is not, on that account, leſs evident that the ſum of the abſolute errors of the dead reckoning, in the one direction or in the other, in forty-nine days, is nearly *eight degrees and a half*.

NOTE XIII.

The longitude deduced for the noon of the 10th, by four ſets of diſtances of the ſun and moon, obſerved in the afternoon, and two ſets of diſtances from the moon to β of *Pollux*, obſerved in the evening, was, by a mean, found to be 53° 16′; and in comparing it to the longitude obſerved on the 8th, 48° 6′, the ſhip's progreſs towards the weſt was, in the interval of the two days, 5° 10′.

It

It is only 4° 56′, by the dead reckoning: thus the ſhip was carried 14 minutes, or 11 miles, to the weſtward.

The ſhip's progreſs in latitude towards the ſouth, in the ſame ſpace of time, was greater by obſervation than by dead reckoning, by 29 minutes, or 29 miles.

On combining the difference towards the weſt with the difference towards the ſouth, it will be found that the current which drove the ſhip out of her apparent courſe, carried her in the direction of ſouth 20° 45′ weſt, at the rate of 31 miles, in two days, or of 15½ miles in twenty-four hours.

By going through the ſame operation for the following days, and comparing the reſults of the obſervations with thoſe of the dead reckoning, as well for the progreſs in longitude as for the progreſs in latitude, it will be found:

That, from the 11th to the 12th, the ſhip appears to have been carried 44 minutes, or 34 miles, to the weſt, and 38 minutes, or 38 miles to the ſouth; which gives ſouth 42° weſt:

That, from the 11th to the 12th, ſhe was carried 24 minutes, or 18.5 miles to the eaſt; and 4 minutes, or 4 miles to the north; which gives 18.6 miles to the eaſt 12° 30′ north.

And that, laſtly, from the 12th to the 15th, ſhe was carried 1 minute, or 1.76 miles to the weſt, and 23 minutes, or 23 miles, to the north; which gives 23 miles to the north 1 or 2° weſt, and 7.6 miles as the mean drift in twenty-four hours.

 The

The action of the currents, in the direction of the longitude, appears neither to have been considerable nor constant in the interval from the 8th to the 15th of March; for the sum of the differences towards the west, between the observation and the dead reckoning, is only 45.75 miles, 18.5 of which were done away by a difference of the same quantity towards the east; and there remain only 27.25 miles, or 35 minutes, for the excess of the sum of the differences towards the west. Lunar observations, made with sextants, as was the case on board of the SOLIDE, may leave an uncertainty of about half a degree respecting the correctness of the results: and, short of that term, we may be in doubt whether the error belong to the dead reckoning or to the observation.

But the action of the currents, in the direction of the latitude, is not doubtful, because the observations which determine it, leave not more than 2 or 3 minutes of uncertainty respecting their results: now, the currents acted in this direction with rather considerable strength, and in an inverse direction to each other. From the 8th to the 10th, they carried the ship 29 minutes, or 29 miles to the south, and from the 10th to the 11th, 38 minutes towards the same side: they afterwards carried her to the north, from the 11th to the 12th, 4 minutes, and from the 12th to the 15th, 23 minutes.

Here then, in the first three days, from the 8th to the 11th, is an unperceived movement of a degree, or 60 miles, towards the south; and I observe that, if we judge from the result of the observations compared with that of the dead reckoning in the same days, the ship was carried at the same time towards the west 58 minutes, or 45 miles: thus we here find again the setting of the currents such as we had previously remarked in the part of the SOUTH ATLANTIC OCEAN which the SOLIDE crossed, where the currents that set to the *southward* set at the same time to the *westward*, and where their tendency

tendency towards the former ſide, which it is eaſy to aſcertain by the obſervation of the latitude, announces their tendency towards the latter, reſpecting which it is not ſo eaſy to determine their effect.

From the 11th to the 12th, their tendency was towards the north and towards the eaſt, and the ſhip was carried 4 miles on the former ſide, and 18.5 on the latter.

But, from the 12th to the 15th, their effect is nearly null in the direction of the longitude, and their action only carries the ſhip 23 miles to the northward.

The SOLIDE, on theſe laſt-mentioned days, and for ſome time paſt, was ſailing at a diſtance from the land which did not exceed 100 leagues; ſhe muſt have experienced all the variations of the current that depend on the winds which reigned or on thoſe which are reigning, and on the action of the tides, combined with that of the particular currents of the coaſts: for it is well known that, in the vicinity of lands, and eſpecially of great continents, the currents vary infinitely in their velocity and direction; that thoſe which are produced by the winds change their direction with them, without in other reſpects changing their extent and velocity; and that, in ſhort, currents are met with ſetting in a contrary direction, which are occaſioned by the horizontal oſcillations of the open ſea in the flux and reflux.

NOTE XIV.

From the 15th to the 22nd of March, the obſervations of latitude ſhewed that the ſhip was daily carried to the northward: the ſum of theſe movements, contrary to the apparent courſe, amounted to 1° 12′ on the 22d at noon, that

is to ſay, after an interval of ſeven days: during the laſt three days, the movement had been 19, 21, and 12 minutes in twenty-four hours; but, on the 23d, it was diſcovered that, from noon of the day before, the currents had ceaſed to ſet to the northward; and that, on the contrary, they had ſet 12 minutes to the ſouthward.

It was expected that, ſince the tendency of the currents had, in general, been to the northward with a rather conſiderable degree of velocity, they would have ſet at the ſame time to the eaſtward; and the reſult of the obſervations for the longitude which were made on the 23d at twenty-eight minutes paſt ſeven o'clock in the morning (a ſet of diſtances obſerved from the moon to α of *Aquila*), confirmed what had been prejudged from the experience of the run.

On comparing the reſult of the 23d to that of the 15th of the ſame month, it will be found that, in the interval of eight days, the progreſs towards the weſt was 4° 29′; but, according to the dead reckoning, it ought to have been 5° 43′: thus the ſhip had been carried to the eaſtward by the ſetting of the currents, 1° 14′, or 58.4 miles.

It has been ſeen that, in the ſame interval, ſhe had been carried by the ſame action, 1 degree, or 60 miles to the northward, deducing the 12 minutes which ſhe had been carried to the ſouthward on the laſt day of the period.

Thus the velocity of the movement which the current had impreſſed on the ſhip was 83.75 miles in eight days, in the direction of north 44° 15′ weſt, and her mean drift in twenty-four hours, 10.4 miles.

NOTE

NOTE XV.

Four ſets of diſtances of the ſun and moon, obſerved on the 25th at thirty-four minutes paſt eight o'clock in the morning, gave for the longitude at noon, 63° 23′: and as that of the 23d was 62° 15′, the progreſs towards the weſt, in two days, had been 1° 8′.

That which was indicated by the reſult of the dead reckoning, for the ſame interval, was only 18 minutes: thus the unperceived movement of the ſhip towards the weſt had been 50 minutes or 36 miles.

According to the obſervations of latitude, the ſhip had been carried, during the ſame time, 11 minutes, or 11 miles to the northward.

Thus the compound effect of the current had cauſed the ſhip to make 37 miles in the direction of weſt 13° 15′ north, at the mean rate of 18.5 miles in twenty-four hours.

NOTE XVI.

By two ſets of diſtances of the ſun and moon, on the 27th at 9^h 1′ 40″ A. M. and the reſult of which was reduced to noon, it was found that, from noon of the 25th, the ſhip's progreſs towards the weſt had been 1° 25′.

According to the dead reckoning, it ought to be 2° 11′: thus, the currents had carried her 46 minutes, or 82.2 miles to the eaſtward.

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The progreſs in latitude towards the ſouth was greater according to the obſervation than according to the dead reckoning, by 2 minutes or 2 miles.

The effect of the current is therefore repreſented by 32.3 miles in the direction of eaſt 3° 30′ ſouth; and the mean drift of the ſhip, in that direction, was 16.1 miles in twenty-four hours.

NOTE XVII.

The reſult of four ſets of diſtances from the moon to the ſun, and of one ſet from the moon to *Antares*, obſerved on the 28th and reduced to noon, ſhewed that, from the 27th to the 28th, the progreſs towards the weſt had been 20 minutes: it therefore was 24 minutes according to the dead reckoning: thus the difference was only 4 minutes or 2.5 miles.

The progreſs towards the ſouth was ſmaller according to the obſervation than according to the reckoning by 5 minutes or 5 miles.

Theſe differences are too ſmall for us to be able thence to draw any concluſion relatively to the effect of the currents: the reſult of the calculation merely indicates an unperceived movement in twenty-four hours of 5.6 miles to the north 26° 30′ eaſt.

NOTE XVIII.

On reducing to noon of the 30th the reſult of four ſets of diſtances of the moon from the ſun, and of one ſet from the moon to *Antares*, obſerved that

ſame

ſame day, it was found that, ſince noon of the 28th the progreſs towards the weſt had been 2° 33′; and that indicated by the dead reckoning was the ſame.

But the progreſs towards the ſouth, in the interval of the two days was greater according to the obſervations than according to the dead reckoning, by 22 minutes, or 22 miles.

It thence reſults that the ſhip had been carried 22 miles in two days, or 11 miles in twenty-four hours.

It is ſeen that, from the 23d the ſetting of the currents and their effect on the ſhip's courſe, no longer indicate the ſame directions as thoſe which had been remarked in the early part of the run, after the ſhip had reached the latitude of 5° ſouth. But the irregularities which are obſerved at preſent will no longer occaſion ſurpriſe, if we conſider the diſpoſition of the lands to the eaſtward of which the SOLIDE recently ſailed: they here form a long gulf at the ſouthern extremity of which is ſituated the STRAIT OF MAGELLAN; and to the eaſtward of this ſtrait lies the archipelago of FALKLAND's Iſlands which forms with the coaſt of the continent a channel eighty leagues in width. Since the 17th of the month, the ſhip had reached the 60th meridian weſt, and, on that very day, had begun to ſtrike ſoundings in ſeventy fathoms: having arrived at this longitude, ſhe ſailed at too ſmall a diſtance from the land, for her to feel the general effect of the currents which act in the open ſea; and ſhe muſt have experienced the irregularities, the variations of thoſe which the oſcillations of the ſea impelled horizontally by the alternate motion of the flux and reflux, the little depth of the waters, the inequalities of the bottom, as well as the diſpoſition and configuration of the lands, muſt neceſſarily produce in a tract of ſea where ſo many cauſes

of

of irregularity, which may either act ſeparately or combine their effects, are thus united.

NOTE XIX.

It had been obſerved that, from the 28th, the currents ſet to the *Eaſtward* at the ſame time that they ſet to the *Southward:* and the obſervations of the 30th having ſhewn that this tendency to the ſouthward continued, it was judged that that which the waters had at the ſame time kept to the eaſtward might probably not ceaſe while the ſhip was croſſing the parallel of the mouth of the STRAIT OF MAGELLAN: it was, in conſequence, decided, that, in the dead reckoning till ſhe came within ſight of STATEN LAND which Captain MARCHAND intended to make, 15 minutes per day ſhould be allowed for the effect of the currents, that is, that 15 minutes ſhould be deducted from the daily progreſs to the weſtward which the calculations of the ſhip's run might appear to indicate.

On the 1ſt of April, at noon, STATEN LAND was diſcovered from the tops; but it was not till four o'clock in the afternoon that Captain MARCHAND very plainly diſtinguiſhed Cape SAN JUAN, the moſt eaſtern point of that land, which bore ſouth 1 or 2° weſt, at the diſtance of thirteen or fourteen leagues eſtimated by the eye.

On adopting the longitude of that cape, ſuch as it was determined in Captain COOK's ſecond voyage*, 296° 13′ eaſt from GREENWICH, or 66° 7′ 15″ weſt from PARIS, that of the ſhip, according to the bearings, ſhould not

* See *The original Aſtronomical Obſervations made in the courſe of a Voyage towards the South Pole and round the World, &c. by* W. Wales. London, 1777, 4to. page 329.

differ from it in a quantity to which it is neceſſary to pay attention; and we may conſider the SOLIDE as being, at four o'clock, under the very meridian of Cape SAN JUAN.

From noon on the 30th of March till four o'clock on the 1ſt of April, the progreſs in longitude, ſuch as it was indicated by the dead reckoning, uncorrected, was 43 minutes towards the eaſt; and by deducting that quantity from 67° 41′, the longitude by obſervation of the 30th at noon, that of the 1ſt of April at four o'clock was 66° 58′; but it ought to have been only 66° 7′ 15″: thus the error on making the land was 50¾ minutes *ahead*, or about 10 leagues on the parallel which the ſhip had reached.

But if, regard being had, as was the caſe, to the correction relative to the effect of the currents, which the experience of the preceding days had indicated, we add 15 minutes for every twenty-four hours, that is, 30 minutes, from the 30th of March to the 1ſt of April, to the progreſs towards the eaſt which the dead reckoning indicated, we ſhall have 1° 13′ to deduct from the longitude by obſervation of the 30th at noon; and that of the 1ſt of April, at four o'clock, will be 66° 28′. Thus the error of this determination, compared with the longitude of Cape SAN JUAN, is only 20¾ minutes, or about 4 leagues: and, indeed, STATEN LAND was perceived at noon on the firſt of April, at the moment when the dead reckoning, corrected and deduced from the longitude by obſervation of the 30th of March, announced that it ought to be diſcerned.

If, in order to aſcertain the effect of the currents in the interval from the 30th of March to the 1ſt of April, we compare the longitude by obſervation of the 30th at noon, 67° 41′, with 66° 8′, the longitude of the 1ſt of April at noon, according to the bearings of Cape SAN JUAN, taken at four

o'clock; it will be ſeen that the progreſs towards the eaſt was 1° 33′: and according to the dead reckoning, it ought to have been only 42 minutes: thus the ſhip was carried, by the currents, 57 minutes, or 30.8 miles to the eaſtward.

On comparing with each other the latitudes by obſervation and thoſe by account on theſe two days, we find that the ſhip was carried to the northward 1 minute from the 30th to the 31ſt, and from the 30th to the 31ſt, 11 minutes: in all 12 minutes.

Thus, in the interval of the two days, the movement of the waters cauſed the ſhip to make 33.25 miles in the direction of eaſt 17° 30′ north, at the mean rate of 16.6 miles in twenty-four hours.

It is ſeen that, from the 25th of March to the 1ſt of April, between the parallels of 44 and 54 degrees, and between the 63rd and the 66th meridian weſt, the direction of the currents was conſtant towards the eaſt, declining ſometimes towards the ſouth, ſometimes towards the north. If we wiſh to comprize in a ſingle calculation this whole period, in order to know what was, pending its duration, the mean effect of the currents on the ſhip's courſe; it will be found that ſhe was carried, in the interval of ſeven days, 7 miles to the ſouthward, and 65.5 to the eaſtward: and on combining theſe two elements, it will be ſeen that ſhe was carried 66 miles in the direction of eaſt 6° 15′ ſouth, at a mean rate of 9⅔ miles in twenty-four hours.

The longitude by account, ſuch as it was deduced from the calculation of the ſhip's run from La Praya, whence her departure was taken, on the 18th of January, till ſhe came within ſight of Staten Land, on the 1ſt of April at noon, was 66° 45′: and if we thence deduct 1 minute for the progreſs

progreſs towards the eaſt from noon till four o'clock on this latter day, we ſhall have 66° 44′ for the longitude by account at the moment of taking the bearings, which placed the ſhip under the meridian of Cape San Juan, and conſequently in 66° 7′. Thus the dead reckoning, at the time of making the land, was in error only 37 minutes, or about 7 leagues *ahead*. But the following Table will ſhew that this exactneſs is not a proof that the ſhip's courſe and diſtance run were well calculated in the courſe of the run; it is ſolely due to compenſations, by means of which, by a fortunate chance, great errors in one direction were done away by equal errors in an oppoſite direction.

TABLE OF COMPARISON

Of the progreſs in Longitude deduced from the Obſervations, with that given by the Dead Reckoning, in the Run from the CAPE DE VERD *Iſlands to* STATEN LAND.

Periods of the Obſervations.	Latitude by Obſervation South.	Longitude by Obſervation West.	Progreſs in Longitude in the interval of the Obſervations, according to Obſervation.	Progreſs in Longitude in the interval of the Obſervations, accordg. to the Dead Reckoning.	Differences of the Progreſs towards the Weſt accordg. to the D. Reckoning, compared to the Progreſs accordg. to the Obſervations.	Interval of the Obſervations.
1791.	° ′	° ′	° ′	° ′	° ′	DAYS.
January	*At La Praya.*	*I. St. Jago.*				
From the 18	14 53 N.	25 51				
February			2 7 W.	1 4 W.	−1 3	In 19.
to the 6th	5 38 S.	27 58				
From the 6th to the 7th	7 00	28 52	0 54 W.	0 46 W.	−0 8	In 1.
From the 7th to the 8th	8 55	29 48	0 56 W.	0 57 W.	+0 1	In 1.
From the 8th to the 9th	10 43	31 8	1 20 W.	0 57 W.	−0 23	In 1.
From the 9th to the 12th	16 10	33 41	2 33 W.	2 11 W.	−0 22	In 3.
From the 12th to the 15th	18 53	35 56	2 15 W.	1 42 W.	−0 33	In 3.
From the 15th to the 16th	20 1	37 6	1 10 W.	44 W.	−0 26	In 1.
From the 16th to the 25th	31 45	47 56	10 50 W.	9 5 W.	−1 45	In 9.
From the 25th to the 26th	32 30	48 23	27½ W.	27 W.	0 00	In 1.
From the 26th						
March						
to the 8th	36 48	48 6	0 17½ E.	3 29 W.	+3 46	In 10.
From the 8th to the 10th	38 44	53 16	5 10 W.	4 56 W.	−0 14	In 2.
From the 10th to the 11th	40 3	55 51	2 35 W.	1 51 W.	−0 44	In 1.
From the 11th to the 12th	40 48	56 28	0 37 W.	1 1 W.	+0 24	In 1.
From the 12th to the 15th	40 59	57 46	1 18 W.	1 17 W.	−0 1	In 3.
From the 15th to the 23d	43 26	62 15	4 29 W.	5 43 W.	+1 14	In 8.
From the 23d to the 25th	43 55	63 23	1 8 W.	0 18 W.	−0 50	In 2.
From the 25th to the 27th	47 3	64 48	1 25 W.	2 11 W.	+0 46	In 2.
From the 27th to the 28th	47 55	65 8	0 20 W.	0 24 W.	+0 4	In 1.
From the 28th to the 30th	51 6	67 41	2 33 W.	2 33 W.	0 00	In 2.
From the 30th						
April						
to the 1st	53 56	66 8	1 33 E.	0 42 E.	+0 51	In 2.
	In sight of *Staten Land.*					

After

After having deducted from the ſum of the differences *plus*, or in exceſs, which is 7° 6′, that of the differences *minus*, or in defect, 6° 29′, the error of the dead reckoning on making the land is reduced, by the chance and effect of compenſations * to 37 minutes in exceſs, or *ahead* of the ſhip.

But the ſum of the errors, in the one direction or in the other, was 13° 35′ in the courſe of a run of ſeventy-three days. A time-piece or chronometer, ſuch as thoſe which are at this day to be procured in FRANCE, would not have left, at the cloſe of this period, an uncertainty of a quarter of a degree reſpecting the longitude which it would have indicated: and in all caſes, the error that may be apprehended from the method of diſtances from the moon to the ſun or ſtars, commonly called the lunar method, will not amount to half a degree, if, in taking the obſervation, the navigator make uſe of BORDA's reflecting circles.

I inſiſt, and ſhall never ceaſe to inſiſt, on this compariſon of the reſult of the common methods with that of the new: we cannot too frequently repeat, that if, at the end of the eighteenth century, when men of ſcience and artiſts have employed themſelves, with ſo much ſucceſs, concerning the problem of the longitude at ſea, ſeamen know not how to guard againſt great errors in their route, it is neither Science nor Art that we muſt blame, but the unpardonable indifference of thoſe who are either ignorant of them, or call them in queſtion.

* *See* Vol. I. page 2, Note §.

THIRD

THIRD RUN

From STATEN LAND to the Islands called LAS MARQUESAS de MENDOÇA.

On the 1st of April, at noon, the SOLIDE took her departure from within sight of STATEN LAND, in latitude 53° 56′ south, and longitude 66° 8′ west.

NOTE XX.

On comparing to the longitude of the place whence the departure was taken that of the 11th at noon, such as it was deduced from two sets of distances of the sun and moon, observed at four o'clock in the afternoon, that is to say, on comparing 77° 3′ to 66° 8′, we find that, in the interval of ten days, the ship's progress towards the west, was, according to the observations, 10° 55′.

But on sailing from the same longitude of the point whence the departure was taken, the sum of the ship's daily progress towards the west, calculated according to the dead reckoning, gives for the total progress, 13° 1′: thus the ship was carried to the eastward, and her perceived progress towards the west, diminished, 2° 6′, or 68.6 miles.

At the same time she was carried to the northward, beyond the progress by account towards that same side, 28 minutes, or 28 miles.

The

The movement of the waters therefore caufed her to make, in ten days, 73.5 miles to the eaft 22° 30′ north, at the mean rate of $7\frac{1}{3}$ miles in twenty-four hours.

In the interval from the 1ft to the 11th of April, the fhip had doubled Cape Horn without going in fight of it, after having got nearly as high as the parallel of 60°.

NOTE XXI.

The refult of the obfervations for the longitude made on the 19th (a fet of diftances from the moon to *Spika Virginis)*, reduced to noon of that day, and compared to the longitude on the 11th at noon, gives for the fhip's progrefs towards the weft, in the interval from the 11th to the 19th 16° 16′; and that which was deduced from the dead reckoning, being only 14° 7′ the difference of thefe two progreffes, 2° 9′, or $71\frac{1}{2}$ miles, is the quantity which the currents had carried the fhip towards the weft beyond her perceived movement.

The comparifon of the latitudes obferved with thofe which were deduced from the dead reckoning, proved that, in the fame fpace of time, the fhip was carried to the fouthward, and the progrefs by account towards the north diminifhed 1° 10′, or 80 miles: and of this quantity, 36 minutes belong to the interval from the 11th to the 18th, and 40, to that from the 16th to the 18th.

The direction impreffed on the fhip by the current was therefore fouth 41° 45′ weft, and the diftance run in that direction was $107\frac{1}{2}$ miles; which gives a mean rate of 13.4 miles in twenty-four hours.

We

We here find again the ſetting of the currents the ſame as it was obſerved in the SOUTH ATLANTIC OCEAN, when the ſhip ſailed at a ſufficiently great diſtance from the land not to feel the action of the currents of the coaſt, or of accidental currents: we ſee that, from the 1ſt to the 11th of April, at the ſame time that they ſet to the *Eaſtward*, they alſo ſet to the *Northward*; and that, from the 11th to the 19th, when they ſet to the *Weſtward*, they at the ſame time ſet to the *Southward*.

It may be remarked that, from the 1ſt to the 11th of April, the ſhip's progreſs by account towards the weſt had been *too great* by 2° 6′, and that from the 11th to the 19th it is *too ſmall* by 2° 9′: it reſults from this compenſation that the longitude by account, deduced from that of Cape SAN JUAN in STATEN LAND, was, on the 11th, in error 2° 9′ towards the *Weſt*; and that, on the 19th, it was in error 3 minutes towards the *Eaſt*: thus the chance of compenſations brought the longitude by account to agree, very nearly, with that which was deduced from the obſervations.

NOTE XXII.

Two ſets of diſtances of the ſun and moon, obſerved on the 24th at thirty-five minutes after eight in the morning, gave for the longitude of that day at noon, 95° 18′.

Two other ſets obſerved the next day, at twenty-three minutes paſt nine o'clock in the morning, gave for the longitude of the 25th, at noon, 96° 9′.

It reſults from theſe obſervations, that the ſhip's progreſs towards the weſt had been 0° 51′ in the twenty-four hours; and, according to the dead reckoning, this progreſs appeared to be only 5 minutes.

If,

If, from the 19th to the 25th, the latitudes obſerved be compared with thoſe which were deduced from the calculation of the courſes which deviated little from the direction of north for a diſtance of 128 leagues in latitude, it will be remarked, that, with the exception of the interval from the 20th to the 23d, during which the ſhip was driven back to the ſouthward, 17 minutes in three days, or $5\frac{3}{4}$ minutes in twenty-four hours, the difference between the reſult of the dead reckoning and that of the obſervation, in all the other days of the period, was almoſt nothing; and it may be concluded that the currents, if any exiſted, acted but with little ſtrength, and only in the interval from the 20th to the 23d: it may therefore be admitted too that, in that from the 24th to the 25th, when the difference between the latitude by account and the latitude by obſervation is only 1 minute, the currents, acted no more towards the eaſt or towards the weſt, than towards the north or towards the ſouth; and we are authorized to conſider the progreſs by account of 5 minutes in longitude towards the weſt as nearly exact, and that of 51 minutes which the obſervations indicated, as much too great. But as it is not poſſible to diſcover whether the error belongs wholly to one of the obſervations, or whether both participated in it, we deem it expedient to take a mean between the reſult of the 24th and that of the 25th, admitting as exact the progreſs by account in longitude in the interval of the two days.

Thus, the longitude by obſervation of the 24th is 95° 18′, add to it the progreſs by account, 5 minutes, you will have, for the 25th, a firſt longitude deduced from the longitude obſerved of the 24th, and it will be 95° 23′: take a mean between the latter and that given by the obſervations of the 25th, 96° 9′, you will have for the latter day, a corrected and mean longitude which will be 95° 46′.

Now, if we compare this laſt-mentioned longitude with that deduced from the obſervations of the 19th at noon, we ſhall find that, in the interval from the 19th to the 25th, in ſix days, the progreſs towards the weſt had been 2° 27′: and if we compare with each other the determinations of the dead reckoning for the ſame days, we ſee that it indicates a progreſs of 2° 26′ in the ſame direction: the difference therefore is only 1 minute, or two-thirds of a mile on the ſide of the dead reckoning: thus, it does not appear that, in the interval of theſe ſix days, the ſhip experienced, from the currents, a perceptible derangement in the direction of the longitude; but, in the ſame ſpace of time, ſhe was carried 17 minutes, or 1 miles to the ſouthward; which indicates, for the direction of the current, ſouth 2° 15′ weſt, and for its effect on the ſhip in that direction, 17.02 miles or 2.84 miles a day.

The longitude by account, deduced from that of Cape San Juan in Staten Land, continues, as is ſeen in the Journal of the Route, to agree, within 4 minutes, with that which reſulted from the obſervations; but it is well known that this agreement is the effect of the fortunate compenſation that took place, between the error of the former period, from the 1ſt to the 11th of April, and that which occurred in an oppoſite direction, in the latter, from the 11th to the 19th of the ſame month.

NOTE XXIII.

Obſervations made on the 8th of May, at forty-eight minutes paſt eight o'clock in the evening, and reduced to noon of that day, gave 96° 44′ for the longitude; and other obſervations made on the 9th at ſeven minutes after four in the afternoon, and, in like manner, reduced to noon, gave 96° 55′: thus, in the interval of twenty-four hours, the ſhip's progreſs in longitude was,

was, according to the obſervations, 11 minutes towards the weſt. That which was deduced from the dead reckoning, for the ſame interval, was, on the contrary, 3 minutes towards the eaſt.

As the progreſs in latitude according to the dead reckoning had differed only by 3 or 4 minutes, from the progreſs by obſervation from the 7th to the 8th, and from the 8th to the 9th, it was preſumed that the action of the currents had been ſcarcely perceptible in the laſt two days of this period, and the progreſs by account of 3 minutes towards the eaſt in the interval from the 8th to the 9th was admitted.

On applying this progreſs by account to the longitude by obſervation of the 8th at noon, which was the mean reſult of ſix ſets of diſtances of the ſun and moon, a freſh reſult, which was 96° 41, was had for the longitude of the 9th at noon: then taking a mean between the latter and that of 96° 55′ given by the obſervations of the 9th for noon of that ſame day, we have 96° 48′, a mean reſult which partakes of the obſervations of the 8th and thoſe of the 9th.

Now, if, by a proceeding ſimilar to that which we have juſt employed, we compare this latter reſult with the longitude of the 25th of April, 95° 46′, we ſhall find that, from the 25th of April to the 9th of May, the ſhip advanced towards the weſt, 1° 2′. But, according to the dead reckoning, this progreſs ought to be 3° 0′: the error of the reckoning was therefore, in fourteen days, 1° 58′, or 93 miles *ahead*, that is to ſay that, in this interval, the ſhip had been carried this latter quantity towards the eaſt: and as the compariſon of the latitudes by obſervation and thoſe by account, announced that, during the ſame time, ſhe had been carried to the northward a quarter of a degree, or 15 miles, it thence reſults that the current

which had driven the ſhip from her apparent courſe, cauſed her to make $95\frac{1}{4}$ miles in the direction of eaſt 9° 15′ north, at the mean rate of 6.8 miles in twenty-four hours.

NOTE XXIV.

Two ſets of diſtances of the ſun and moon obſerved on the 12th at twenty minutes paſt three o'clock in the afternoon, and two ſets of diſtances from the moon to *Spica Virginis*, obſerved on the evening of the ſame day, both reduced to noon, gave, by a mean, 98° 51′ for the longitude.

On comparing it to that of the 9th at noon, 96° 48′, we find 2° 3′ progreſs towards the weſt. The progreſs by account towards the ſame ſide, in the ſame interval, is 1° 55′; the difference which is only 8 minutes, or 7 miles, would indicate that the ſhip was driven that quantity towards the weſt beyond her apparent run: and as the obſervations of latitude prove that ſhe was, at the ſame time, carried 10 minutes or 10 miles to the ſouthward, it may be concluded that the effect of the currents was $12\frac{3}{4}$ miles to the ſouth 34° 45′ weſt, and 4 miles in twenty-four hours.

NOTE XXV.

On the 23d, a mean between the reſults of ſix ſets of diſtances of the ſun and moon, obſerved at thirty-one minutes paſt eight in the morning, gave for the longitude at noon, 111° 56′: that of the 12th at noon, was 98° 51′: thus, in the interval of eleven days, the progreſs towards the weſt, was according to the obſervations, 13° 5′.

According

According to the dead reckoning, it was only 9° 53′: thus the ſhip had been carried to the weſtward 3° 12′; and the error of the reckoning *aſtern*, had been this quantity, or 173 miles, in the interval of eleven days.

If we compare the latitudes obſerved every day with thoſe indicated by the dead reckoning, we ſhall find that, in the ſame ſpace of time, the ſhip was carried by the movement of the waters, 52 minutes, or 52 miles, to the ſouthward.

On combining the 173 miles Weſting with the 52 miles Southing, it will be ſeen that the effect of the current on the ſhip's courſe was 180.5 miles, or 60⅛ leagues, in the direction of weſt 16° 45′ ſouth; and the mean drift 16.4 miles, or about 5½ leagues, in twenty four hours.

NOTE XXVI.

If we wiſh to make, for the following days, the 24th, 25th, 26th, and 27th, when ſets of diſtances of the moon from the ſun or ſtars were obſerved, the ſame calculations which we made for the 23d, the following reſults will be found,

From the 23d to the 24th	According to the Obſervations..	1° 45 W.	The ſhip was carried to the weſtward in 24 hours 0° 28′
	According to the Dead Reckoning	1 17 W.	

According to the obſervations of latitude ſhe was carried to the ſouthward 0° 10′

From the 24th to the 25th	According to the obſervations..	1 16 W.	Carried to the weſtward.... 0° 16′
	According to the dead reckoning	1 00 W.	

According to the obſervations of latitude ..... To the ſouthward 0° 14

From

		° ′	
From the 25th to the 26th	According to the obſervations . .	0 41 W.	Carried to the weſtward . . . . 0° 6′
	According to the dead reckoning	0 35 W.	
According to the obſervations of latitude. . . . . To the northward 0° 2′			

From the 26th to the 27th	According to the obſervations . .	0 56 W.	Carried to the weſtward . . . . 0° 8′
	According to the dead reckoning	0 48 W.	
According to the obſervations of latitude. . . . . To the ſouthward 0° 4′			

The ſum of the quantities which the ſhip advanced towards the weſt beyond the progreſs by account, from the 23d to the 27th, was 0° 58′ or 54 miles, and that which ſhe was carried to the ſouthward 26 minutes, or 26 miles: on combining theſe two ſums, we find that the action of the current carried the ſhip, in the interval of four days, 59 miles, to the weſt 23° 30′ ſouth; this is, at the rate of 14.75 miles, or about five leagues in twenty-four hours.

If it be wiſhed to embrace a longer period, that from the 12th to the 27th, it will be found that, in the interval of theſe fifteen days, the ſhip was carried to the weſtward, beyond her apparent progreſs, 4° 10′ or 228 miles; and to the ſouthward, 1° 18′ or 78 miles: and on combining theſe two quantities, we find that the error of the courſe was 242 miles or 80⅔ leagues, to the weſt 18° 45′ ſouth; which indicates a mean effect of the action of the currents in that direction, of about 16 miles in twenty-four hours.

It is ſeen, that from the 9th to the 27th, between the parallels of 30° and 19° 30′ ſouth, the currents carried the ſhip conſtantly to the ſouthward,

at a rate which varied from 4 to 16 miles in twenty-four hours; and it will be recollected that, in the South Atlantic Ocean, between the ſame parallels, we had found the ſame direction in the currents and a velocity which had varied from 10 to 18 miles a day.

It has been ſeen (Note XXII) that the longitude by account from the time of the ſhip being in ſight of Staten Land, according to the calculation of her run, had, on the 25th of April, drawn near the longitude by obſervation, and, through the effect of compenſations, differed from it no more than 4 minutes *aſtern*; from the 25th of April to the 9th of May (Note XXIII) the error of the reckoning had been 1° 58′ *ahead*, the longitude by account was at this latter period, 1° 54′ *ahead*; but the error having been 8 minutes aſtern from the 9th to the 12th of May (Note XXIV); 3° 12′, from the 12th to the 23rd (Note XXV); and 58 minutes, from the 23rd to the 27th; theſe accumulated errors in the ſame direction, deducting 1° 54′ *ahead*, produce, on the laſt day, a total error of 2° 24′ *aſtern* in the longitude by account.

NOTE XXVII.

On the 6th of June, the mean between the mean reſults of four ſets of diſtances obſerved from the moon to the ſun, and two ſets of diſtances from the moon to *Spica Virginis*, reduced to noon of the ſame day, gave for the longitude of the ſhip, at that moment, 127° 10′: and on comparing it with that which had been deduced from the obſervations of the 27th of May, it is ſeen that the ſhip's progreſs towards the weſt, had been 10° 36′. That which was indicated by the dead reckoning, for the ſame interval, was 10° 23′: thus the difference was only 13 minutes, or 12.5 miles, which

 the

the ſhip appeared to have been carried to the weſtward beyond the progreſs by account.

On examining the ſhip's daily progreſs towards the north, according to the dead reckoning, and the progreſs according to the obſervations, we find that the ſum of the former is equal to the ſum of the latter: the differences in the one direction and in the other are exactly counterbalanced.

We may therefore conclude that, from the 27th of May to the 6th of June, the currents effected no perceptible change either in the ſhip's apparent courſe or rate of ſailing: for the 13 minutes, or 12.5 miles, difference towards the weſt, might proceed from the obſervations as well as from the dead reckoning.

The ſame agreement between the reſults of the obſervations and the calculations of the reckoning continued for the two following days.

From the 6th to the 7th, the ſhip's progreſs towards the weſt, according to the obſervations was 2° 15′; and 2° 14′, according to the dead reckoning.

From the 7th to the 8th, 1° 43′ according to the obſervations, and 1° 52′ according to the dead reckoning: the difference therefore is only 9 minutes, but in a contrary direction to thoſe of the preceding days.

The progreſs in latitude deduced from obſervation, and compared with that given by the dead reckoning ſhews that the apparent progreſs of the ſhip, in this direction, differed little from her real progreſs: from the 6th to the 7th,

the dead reckoning gives 3 minutes leſs towards the ſouth than the obſervation, and 1 minute only from the 7th to the 8th.

It therefore appears that, in the interval of theſe laſt two days, the ſhip experienced no effect from the currents.

NOTE XXVIII.

The action of the currents was again felt from the 8th to the 10th.

Eight ſets of diſtances of the ſun and moon obſerved on the 10th two ſets of diſtances from the moon to *Regulus*, and two others from the moon to *Antares*, gave, by a mean between the three mean reſults, for the longitude of the ſhip, reduced to noon of that ſame day, 135° 52′; and on comparing it with that of the 8th, we find that, in the interval of the two days, the ſhip's progreſs towards the weſt was, according to the obſervation, 4° 44′: it is only 3° 51′, according to the dead reckoning: thus, the ſhip was carried 53 minutes, or about 52 miles, to the weſtward.

From the 8th to the 10th, according to the obſervations of latitude, the ſhip was carried 7 minutes, or 7 miles to the ſouthward: thus the current had cauſed her to make an imperceptible drift of $52\frac{2}{7}$ miles to the weſt, 7 or 8° ſouth, or $26\frac{1}{7}$ miles in twenty-four hours in that direction.

NOTE XXIX.

The obſervation of latitude of the 11th proved that, in the twenty-four hours which preceded the noon of that day, the action of the currents had again carried the ſhip 10 minutes to the ſouthward. It had been almoſt

 conſtantly

conſtantly found in croſſing the GREAT OCEAN, that, when they ſet towards the *South*, they alſo ſet towards the *Weſt*, and in a more conſiderable quantity: and as our navigators, the next day, expected to diſcover the Iſlands called LAS MARQUESAS DE MENDOÇA, they judged it expedient to add to the daily progreſs in longitude which the dead reckoning indicated towards the weſt, from the time of the obſervations of the 10th till they made the land, the quantity of 26 minutes in twenty-four hours, in order to compenſate for the effect of the currents which they ſuppoſed muſt drive the ſhip towards that ſide, in the ſame proportion as they had carried her thither on the preceding days at the ſame time that they carried her to the ſouthward.

On calculating the run according to this ſuppoſition, they expected to diſcover the MENDOÇA Iſlands towards noon of the 12th, and, in fact, at half paſt ten in the morning of that day, they began to perceive the Iſland of LA MADALENA, the moſt eaſtern and moſt ſouthern of the group.

At noon, it bore ſouth-weſt; and the Iſland of SAN PEDRO bore directly weſt at the diſtance of fourteen leagues eſtimated by the eye.

The longitude of this laſt-mentioned iſland, determined by the obſervations made in Captain COOK's ſecond voyage*, is 221° 9′ eaſt from GREENWICH, or 141° 11′ 15″ weſt from PARIS. If we take from this quantity 42 minutes, which are equivalent to the diſtance of 14 leagues eſtimated at the time of taking the bearing, we ſhall have 140° 29′ 15″ for the longitude

* See *the Original Aſtronomical Obſervations made in a voyage towards the South Pole*, &c. Page 323.

of

of the ſhip which was exactly on the parallel of the iſland: on adding to the reſult of the obſervations of the 10th the progreſs by account towards the weſt ſince that period, 4° 23′ (3° 21′, according to the dead reckoning, *plus* 52 minutes for the effect of the current) it will be found that the preſumed longitude on making the land was only 140° 15′: the error of this determination was therefore 14¼ minutes, which anſwer to no more than 4⅓ leagues; but, according to the calculation of the ſhip's apparent courſe and diſtance, paying no regard to the foreſeen effect of a current towards the weſt, the progreſs towards that ſide would, from the 10th to the 12th, have been only 3° 31′; and on adding it to the longitude of the 10th, it would have made only 139° 23′: thus the error would have been 1° 6′ 15″ or 21½ leagues.

In regard to the latitude of San Pedro, the obſervations of Captain Cook's voyage give for it 9° 59′: and this is exactly the ſame as that which was obſerved on board the Solide.

Let us ſee what was the error of the dead reckoning in the interval of the laſt two days.

On comparing the longitude obſerved on the 10th with that of the ſhip at the time of making the land on the 12th, that is, 135° 52′ with 140° 29′, it is ſeen that the real progreſs towards the weſt was 4° 37′; but, according to the dead reckoning, it was only 3° 31′: thus, in two days, the currents carried the ſhip towards the weſt 1° 6′, or 65 miles.

The compound and unexperienced movement was therefore 67.25 miles to the weſt ſouth, and 33⅔ miles in twenty-four hours.

Let us examine at present what would have been the error of the dead reckoning on making the land of the MENDOÇA Islands, if, from the time of her being in sight of STATEN LAND, our navigators had adhered to its results, and had not corrected them every day that the state of the weather allowed of determining by observation the longitude of the ship, and of ascertaining the errors which the action of the currents, or any other cause, had introduced in the direction which she appeared to have followed and the distance which she seemed to have run.

Periods of the Observations.	Latitude by Observation South.	Longitude by Observation West.	Progress in Longitude in the interval of the Observations accords to Observation.	Progress in Longitude in the interval of the Observations accords. to the Dead Reckoning.	Differences of the Progress towards the West accords. to the D. Reckoning compared to the Progress accords. to the Observations	Interval of the Observations.
1791.	° ′	° ′	° ′	° ′	° ′	days.
April	In sight of *Staten Land.*					
the 1st	53 56	66 8	10 55 W.	13 1 W.	+ 2 6	10
From the 1st to the 11th	59 44	77 3				
From the 11th to the 19th	52 33	93 50	16 16 W.	14 7 W.	− 2 9	8
From the 19th to the 25th	46 8	95 46	2 27 W.	2 26 W.	− 0 1	6
From the the 25th						
May						
to the 9th	30 12	96 48	1 2 W.	3 00 W.	+ 1 58	14
From the 9th to the 12th	28 25	98 51	2 3 W.	1 55 W.	− 0 8	3
From the 12th to the 23rd	23 5	111 56	13 5 W.	9 53 W.	− 3 12	11
From the 23rd to the 24th	21 54	113 41	1 45 W.	1 17 W.	− 0 28	1
From the 24th to the 25th	21 3	114 57	1 16 W.	1 00 W.	− 0 16	1
From the 25th to the 26th	20 22	115 38	0 41 W.	0 35 W.	− 0 6	1
From the 26th to the 27th	19 32	116 34	0 56 W.	0 48 W.	− 0 8	1
From the 27th						
June						
to the 6th	12 10	127 10	10 36 W.	10 23 W.	− 0 13	10
From the 6th to the 7th	11 12	129 25	2 15 W.	2 14 W.	− 0 1	1
From the 7th to the 8th	10 18	131 8	1 43 W.	1 52 W.	+ 0 9	1
From the 8th to the 10th	9 54	135 52	4 44 W.	3 51 W.	− 0 53	2
From the 10th to the 12th	9 59	140 29	4 37 W.	3 31 W.	− 1 6	2
	In sight of the Isle of *San Pedro.*					

Sum of the errors towards the East. . . . . 8° 41′

Sum of the errors towards the West. 4 13

Remainder in error towards the East or *astern* after the compensation 4 28

It

It is ſeen that the ſum of the errors of the dead reckoning, towards the one ſide or towards the other, in the ſpace of ſeventy-three days, is 12° 54′: and although ſome fortunate compenſations had taken place, the error at the time of making the land is ſtill 4° 28′, or 87¾ leagues to the eaſtward, that is, *aſtern* of the true poſition of the ſhip: now it is well known that an error *aſtern* is always dangerous, ſince it is poſſible that a navigator may fall in with the land in the night, while he thinks himſelf ſtill at a diſtance from it.

NOTE XXX.

The obſervations made in Captain Cook's ſecond voyage have given the following determinations for the Iſlands called Las Marquesas de Mendoça:

	Latitude South.	Long. weſt from Paris.
	° ′ ″	° ′ ″
Hood's Iſland	9 26 00	141 12 15
San Pedro or *O-Niteiö*	9 58 00	141 11 15
Santa Chriſtiana or *Wahitahô*, at the Harbour of *La Madre de Dios*	9 55 30	141 28 55
La Dominica or *O-Hivahöa*	9 40 37½	141 21 52½
La Madalena	10 25 30	141 09 15

No obſervations were made for determining immediately the longitude of the harbour of La Madre de Dios in the Iſland of Santa Christina, to which the others are ſubjected: but on the days, which preceded, and on thoſe which followed the Resolution's arrival at this port, Mr. Wales had taken ſeveral obſervations of the moon's diſtance from the ſun, and he reduced them

them by calculation, and with the help of a *chronometer* to the position of the harbour of La Madre de Dios *.

The meridian altitudes of the sun which were employed for determining the latitude of the same harbour, were taken on the 9th and 10th of April 1774 from a quicksilver horizon with a Hadley's sextant, and by the back observation: they gave for the latitude of La Madre de Dios, the former 9° 55′ 15″, and the latter 9° 55′ 45″†.

FOURTH RUN

From the Islands called LAS MARQUESAS DE MENDOÇA to the NORTH-WEST Coast of AMERICA.

On the 20th of June, at eleven o'clock at night, the Solide took her departure from the Harbour of La Madre de Dios, in 9° 55′ 30″ south latitude, and 141° 28′ 55″ west longitude.

NOTE XXXI.

On the 22d, in sight of Ile Marchand (Marchand's Island) the longitude of the ship, reduced to noon, was determined by six sets of distances of the moon from the sun and two sets of the moon from α of *Aquilla* at

* See *The Original Astronomical Observations made in a Voyage towards the South Pole*, &c. Pages 322, 323 and 82. The Longitudes are there reckoned from the Meridian of *Greenwich*; we have reduced them to that of *Paris*, admitting this city to be situated 2° 20′ 15″ to the *East* of *Greenwich*.

† See *The Original Astronomical Observations made in a voyage towards the South Pole*, page 81.

142°

142° 27′: thus the progreſs in longitude towards the weſt, ſince the departure taken from La Madre de Dios, had been 0° 58′.

That given by the dead reckoning differed from it only 3 minutes or 2.96 miles in exceſs.

The latitude by account agreed with the latitude by obſervation.

It may be concluded from the reſult of theſe compariſons, that the currents which had ſet with a great velocity to the weſt 18° 30′ ſouth, while the ſhip was ſailing to the eaſtward or to windward of the Mendoça Iſlands, had not been felt while ſhe was ſtanding to the north-weſt or to leeward of them.

NOTE XXXII.

Two ſets of diſtances of the ſun and moon gave for the longitude of the 24th at noon, 143° 10′. And on comparing it with that of the 22nd it is ſeen that, in the ſpace of two days, the ſhip's progreſs towards the weſt was 0° 43′.

That which was indicated by the dead reckoning was only 0° 36′: thus it would appear that in two days, the ſhip was carried to the weſtward, 7 minutes or 6.9 miles.

According to the obſervations of latitude, ſhe was carried, in the ſame ſpace of time, 6 minutes or 6 miles to the ſouthward.

The effect of the currents had therefore been 9.1 miles or 4.56 in twenty-four hours, to the weſt 4° ſouth.

NOTE

NOTE XXXII.

By the obſervations of the 25th, the longitude of the ſhip, at noon, was 143° 49′; and her progreſs towards the weſt had been, ſince the 24th, 39 minutes.

It was only 21 minutes, according to the dead reckoning: thus, in twenty-four hours, the ſhip had been carried 18 minutes or 17.8 miles to the weſtward.

The obſervation of latitude ſhewed that, during the ſame time, ſhe had been carried 12 minutes or 12 miles to the northward.

Thus her unperceived movement had been 21.5 miles to the weſt 33° 45′ north.

At this period our navigators had loſt ſight of the Iles de la Révolution (the Revolution Iſlands), and were on a parallel more northerly by about 2¼ degrees than the moſt northern part of the group.

NOTE XXXIV.

On the 20th of July, four ſets of obſervations of the moon's diſtance from the ſun gave, by a mean, for the longitude of the ſhip reduced to noon, 156° 2′: and on comparing it with that of the 25th of June, we find that, in the ſpace of twenty-five days, the progreſs towards the weſt was 12° 13′.

According to the dead reckoning, the progreſs in the ſame interval had been only 10° 27′; and thence it was concluded that the ſhip was carried 1° 46′, or 101.2 miles to the weſtward.

If

If we compare on each day the latitude deduced from obſervation with that indicated by the dead reckoning, it is ſeen that the action of the currents carried the ſhip almoſt uninterruptedly to the northward, except on the laſt four days of the period: the ſhip's imperceptible progreſs towards that ſide was frequently 10, 11, 15, and as much as 16 miles in twenty-four hours. Their ſum is 2° 13′: and if we thence deduct that of ſome accidental differences towards the ſouth, amounting to 19 minutes only, there remain 1 degree 54 minutes, or 114 miles, which the currents had carried the ſhip to the northward.

On combining the two movements, we find that, in twenty-five days, the ſhip made, by a compound and unperceived movement, 152.8 miles in the direction of north 41° 45′ weſt; that is, that her mean drift in that direction was 6.1 miles in twenty-four hours.

It appears therefore, that, in this latitude, contrary to what we had obſerved in the South Atlantic Ocean, and in the Great Auſtral Ocean, the currents which ſet to the *Northward*, ſet at the ſame time to the *Weſtward*.

It appears too, as may be ſeen in the Journal of the Route; that errors ſomewhat conſiderable in the latitudes took place from the parallel of 8° ſouth, as far as beyond the Tropic of Cancer, between 142° 30′ and 152° 40′ of weſt longitude; and that, in croſſing this part of the Torrid Zone, the waters, during a month, conſtantly ſet to the northward and weſtward.

But the quantity of the error of the dead reckoning in both directions, ſuch as we have before determined it, does not exactly indicate the quantity which the ſhip was carried to the weſtward, nor that which ſhe was carried to the northward: for it appears by Captain Chanal's Journal, that being

 aſtoniſhed

aſtoniſhed at the conſtant errors in latitude which had been diſcovered for ſome time paſt, and almoſt always on the ſame ſide, Captain MARCHAND directed that the *half-minute* glaſs, which is employed in meaſuring time while the log is meaſuring the ſhip's way, ſhould be carefully examined: on comparing it with a watch with a ſecond hand, which was well regulated, it was aſcertained that the time which the ſand took to run out, was not exactly thirty ſeconds, as in the former part of the voyage, and that it was too ſhort by 2 or 3 ſeconds. It reſulted from this error of the glaſs reſpecting the meaſure of time, that the ſhip's way eſtimated by means of the log, was ſhorter than the way which ſhe actually made, by about a *twelfth*; and that the ſhip's courſe being between the north and the weſt, her progreſs in latitude and longitude according to the dead reckoning, ought to have been ſmaller by a twelfth than that which would have been found if the ſand-glaſs had exactly indicated the duration of thirty ſeconds.

On applying to the calculations of the dead reckoning the correction required by this acknowledged error, we ſhall have freſh reſults.

According to the obſervations, the progreſs in longitude, in the interval from the 25th of June to the 20th of July, was 12° 13′. The error of the dead reckoning *in defect* ought to have been only a twelfth of this quantity, that is, 1° 1′: we ſhall find it 1° 46′; therefore there remain ſtill 45 minutes *in defect*, which may be attributed to the action of the currents that ſet the ſhip to the weſtward.

If we examine the error in latitude during the ſame period, we ſhall find that the ſum of the partial errors (a compenſation having taken place between thoſe which, being in a contrary direction, do away each other) is only 1° 54′ towards the ſouth: but as the ſhip's real progreſs in latitude towards the north

north is, according to the obſervations of the two extreme days of the period, 34° 24′; the ſum of the daily errors of the reckoning, *in defect* or towards the ſouth, ought to have been, in proportion to the error of the half-minute glaſs, a twelfth of the real progreſs, that is, 2° 52′: however, it is but 1° 54′, that is, ſmaller by 58 minutes than it ought to have been: this diminution can proceed only from a cauſe, which, acting in a direction contrary to the error of the glaſs, carried the ſhip to the northward, and it muſt be believed that it is the effect of a current, which, in the interval from the 25th of June to the 20th of July, carried the ſhip 58 minutes towards that ſide. It will be ſeen that the tendency of the waters towards the north was conſtant, from the eighth parallel ſouth to the land-fall on the NORTH-WEST coaſt of AMERICA, in the latitude of 57° 15′ north.

If, with theſe new data, 45 minutes, or 43 miles, towards the weſt, and 58 minutes, or 58 miles, towards the north, which the currents appear to have driven the ſhip out of her apparent courſe, it were wiſhed to calculate what were the velocity and direction of her unperceived movement, it would be found that ſhe made 72.3 miles to the north 36° 30′ weſt; which gives for the mean drift in that direction 2.9 miles in twenty-four hours.

NOTE XXXV.

The mean reſult of four ſets of obſervations of diſtances of the ſun and moon, gives for the longitude of the 23d at noon, 154° 25′; and on comparing it to that of the 20th, it is ſeen that the ſhip's progreſs was 1° 37′ towards the eaſt: and, as according to the dead reckoning, this progreſs appears to have been 1° 40′, it follows that, in the ſpace of three days the currents may have carried the ſhip 3 minutes, or 2.6 miles to the weſtward.

The compariſon of the progreſs towards the north, according to the obſervation and according to the dead reckoning, ſhews that the ſhip was carried, during the ſame time, 11 minutes, or 11 miles to the northward.

Thus the unperceived movement was 11.3 miles to the north 13° 15′ weſt; and the mean drift in that direction 3.76 miles in twenty-four hours.

The difference between the progreſs in longitude by obſervation and the progreſs by account, is too ſmall for us to be able thence to conclude that the currents ſet to the weſtward; but the obſervations of latitude afforded the certainty that they continued to ſet to the northward.

NOTE XXXVI.

The obſervations for the longitude and latitude, made on the 24th, lead to a reſult ſimilar to that of the preceding note.

The progreſs towards the eaſt, according to the dead reckoning, differs, in the interval from the 23d to the 24th, from that deduced from the obſervations, only by 2 minutes in exceſs; that is, that the obſervation carries the ſhip 2 minutes, or 1.67 miles, to the weſtward.

But the obſervation of latitude proves that, in the ſame ſpace of time, ſhe was carried 21 minutes, or 21 miles, to the northward.

If we chooſe to take notice of 1.67 miles to the weſtward, the unperceived movement in twenty-four hours will have been 21 miles in the direction of north 4° 30′ weſt.

NOTE

NOTE XXXVII.

The longitude for the 26th at noon, deduced from two ſets of diſtances of the ſun and moon, was 152° 17′: and in comparing it to that of the 24th, we find that the progreſs towards the eaſt was 1° 15′.

The dead reckoning gives for this progreſs 1° 32′. Thus, on comparing it to that of the obſervation, the ſhip had been carried to the weſtward 17 minutes, or 13.6 miles.

According to the obſervations of latitude ſhe was carried 15 minutes, or 15 miles to the northward.

The unperceived movement in the interval of two days, was therefore 20¼ miles to the north 42° 30′ weſt; and her mean drift in twenty-four hours was 10.12 miles.

NOTE XXXVIII.

The mean reſult of four ſets of obſervations of diſtances of the ſun and moon, reduced to noon, of the 5th of Auguſt, gave for the longitude of the ſhip at that period, 143° 46′; and on comparing it to that of the 26th of July, we find that, in the interval of ten days, the progreſs towards the eaſt had been 8° 31′:

According to the dead reckoning, it was only 7° 27′: the difference, 1° 4′, or 43.9 miles, expreſſes the quantity which the ſhip appears to have been carried to the eaſtward by the ſetting of the currents.

It is ſeen, on comparing on each day the latitude by account with that by obſervation, that, in the ſame ſpace of time, ſhe was carried 54 minutes or 54 miles to the northward.

It will be found, by calculation, that the unperceived movement was 69.25 miles to the north 39° eaſt; and that the mean drift in that direction was about ſeven miles in twenty-four hours.

NOTE XXXIX.

On the 7th at noon, the latitude, according to obſervation, was 57° 20′; and on deducing from the longitude obſerved on the 5th the eſtimated progreſs towards the eaſt in the interval of the two days, 3° 50′, the longitude of the 7th at noon was 139° 56′. In this poſition, the ſhip was 15½ minutes more to the northward, and 1° 40′ 15″ or 94 miles more to the weſtward than Cape del Engaño (Cook's Cape Edgecumbe) which ought to have borne eaſt about 15° ſouth, at the diſtance of 18 or 19 leagues.

In this ſuppoſition, Captain Marchand ſtood on in the direction indicated, and at half paſt five o'clock in the afternoon, he perceived the coaſt of America.

At ſix o'clock, Cape del Engaño bore eaſt 19° 30′ ſouth, diſtant 13 or 14 leagues.

From noon till ſix o'clock, according to the traverſe table*, the ſhip had advanced 4.89 miles, or 4′ 53″ towards the ſouth, and 15.34 miles or 28′ 30″ towards the eaſt.

* The ſhip had run; eaſt 7° 43′ ſouth, 3 miles—eaſt 17° 30′ 10 miles—eaſt 24° 36′ ſouth 3¼ miles.

On

On subtracting these quantities, the former from the latitude, the latter from the longitude of the ship at noon, we have for her position at six o'clock, Latitude 57° 15′ 7″——Longitude 139° 27′ 30″.

Let us see what must be her true situation according to the bearing of Cape DEL ENGAÑO, taken at the same moment.

Since the Cape bore east 19° 30′ south, distant 13 leagues, the ship was 13′ 13″ more to the northward than the Cape, and 1° 10′ 48″ more to the westward.

Let us apply these differences to the latitude of the Cape 57° 4′ 30″, and to its longitude 138° 15′ 45″, such as they were determined by the observations made in Captain COOK's third voyage *, we shall find that the latitude of the ship must be 57° 18′ 0″, and her longitude 139° 26′ 33″.

In lieu of these quantities, we have found 57° 15′ 7″ for the one, and 139° 27′ 30″ for the other: the error on making the land was therefore:

In Latitude, 2′ 53″, or about 1 league too little to the northward;
In Longitude 0′ 57″, or about one sixth of a league too much to the westward.

Let us examine, at present, what was the error of the reckoning in two days and a quarter, from the 5th at noon, to the 9th at six o'clock in the evening, the period at which the bearings were taken of Cape DEL ENGAÑO.

* The *original astronomical observations made in a voyage to the Northern Pacific Ocean, &c.* page 349. Latitude according to *Cook* and *King* 57° 3′; according to *Bayly* 57° 6′—Mean 57° 4½′. Longitude according to *Cook* and *King*, 224° 7′; according to *Bayly*, 224° 2′—Mean 224° 4′ 30″ east from *Greenwich*, or 138° 15′ 45″ west from *Paris*.

According

According to the obſervations of the 5th and the bearing of the 7th, the ſhip's progreſs in latitude towards the north was 2° 6′; and according to the dead reckoning, 1° 40′ 7″ only*: the difference, 25′ 53″, or 25.9 miles, is the quantity which the ſhip was carried to the northward, by the action of the currents, in the interval of two days and a quarter.

The progreſs in latitude towards the eaſt, in the ſame ſpace of time, was 4° 19′ 27″; and according to the dead reckoning it is 4° 18′ 30″†: the difference therefore is only 0′ 57″ and may be conſidered as null.

Thus it is ſeen that, if, from the 5th to the 7th, the currents carried the ſhip to the northward 26 miles in 54 hours, or 11.5 miles a day, they produced no material change on the ſhip's courſe in the direction of the longitude.

As for the longitude by account given, on making the land, by the dead reckoning, deduced from the Bay of La Madre de Dios, it was 138° 30′, at noon on the 7th, and 138° 11′ 30″ at the moment of the bearing being taken at ſix o'clock; and as the true longitude at this latter period was 139° 26′ 30″, the difference was only 1° 25′ or 15¾ leagues *ahead:* I ſay *ahead*, with reſpect to the land, at which it was intended to touch, and which was ſituated to the eaſtward of the ſhip: but this exactneſs is the effect of the

* From noon on the 5th to noon on the 7th, the progreſs by account towards the north had been 1° 45′ (ſmaller by 23 minutes than the progreſs by obſervation in the ſame interval): from noon to ſix o'clock in the evening of the 9th, the progreſs by account towards the ſouth was 4′ 53″, which muſt be deducted from the progreſs by account towards the north; and the remainder, 1° 40′ 7″, will be the progreſs by account towards the ſame ſide, from noon of the 5th to ſix o'clock in the evening of the 7th, the period when the bearings were taken.

† From noon of the 5th to noon on the 7th, 3° 50′; and 28′ 30″ from noon on the 7th to ſix o'clock in the evening of the ſame day.

com-

compensations of partial errors in contrary directions, which took place in the course of the run.

The following table exhibits the partial errors of the dead reckoning in either direction, at the different periods of the observations that were employed for determining the longitude of the ship.

Periods of the Observations.	Latitude by Observation South.	Longitude by Observation West.	Progress in Longitude in the interval of the Observations, according to Observation.	Progress in Longitude in the interval of the Observations, accord^g. to the D. Reckoning.	Differences of the Progress towards the West or towards the East accord^g to the D. Reckon^g compared to the Progress accord^g. to the Observations.	Interval of the Observations.
1791.	° ′	° ′	° ′	° ′	° ′	DAYS.
June.	In the Bay of *La Madre de Dios*					
The 20th	9 55½	141 29				
From the 20th to the 22d	9 21	142 27	0 58 W.	1 1 W.	+0 3 W.	2.
From the 22nd to the 24th	7 54	143 10	0 43 W.	0 36 W.	—0 7 W.	2.
	South.					
From the 24th to the 25th	5 42	143 49	0 39 W.	0 21 W.	—0 18 W.	1.
From the 25th	.....	.....	12 13 W. (See Note XXXIV.)	10 27 W. or 11 28 W.	—1 46 W. or —0 4 W.	25.
July	North.					
to the 20th	28 42	156 2				
From the 20th to the 23d	32 10	154 25	1 37 E.	1 40 E.	+0 3 E.	3.
From the 23rd to the 24th	34 5	153 32	0 53 E.	0 55 E.	+0 2 E.	1.
From the 24th to the 26th	37 49	152 17	1 15 E.	1 32 E.	+0 17 E.	1.
From the 26th	.....	.....	8 31 E.	7 27 E.	—1 4 E.	10.
August						
to the 5th	55 12	143 46				
From the 5th to the 7th	57 18	139 26½	4 19½ E.	4 18½ E.	—0 1 E.	2¼.
At 6 o'clock in the evening, in sight of Cape *del Engaño*, on the North-west coast of *America*.						

It is seen that, in the course of this run, the errors of the reckoning respecting the longitude were inconsiderable, either in the one direction, or in

in the other, and in part counterbalanced each other. The ſum of the errors *aſtern*, relatively to the weſt, that is to ſay, the ſum of the quantities *minus Weſt* and *plus Eaſt*, is 2° 33′* : that of the errors *ahead*, or of the quantities *plus Weſt* and *minus Eaſt*, is 1° 8′ : and it is remarkable that the longitude of the point arrived at differing from that of the point of departure, only about 2 degrees (La Madre de Dios in 141° 29′ weſt, and the point from which the bearing was taken Cape del Engaño in 139° 26′ 33″ weſt) the ſum of the errors of the reckoning is almoſt double the difference of the meridians. But if we deduct from the ſum of the errors *aſtern* that of the errors *ahead*, there remains, after the compenſation, only 1° 25′ *aſtern*, a quantity which becomes an error *ahead* relatively to the land ſituated to the eaſtward of the ſhip, towards which ſhe is directing her courſe.

The examination of this run leads us to make a few remarks.

1. From the 25th of June to the 5th of Auguſt, the progreſſes ſometimes towards the weſt, ſometimes towards the eaſt, ſuch as were indicated by the obſervations, nearly balance each other, and the direct courſe of the ſhip deviates little from a meridian; for, according to the obſervations, the longitude of the 25th of June was 143° 49′, and that of the 5th of Auguſt, 143° 46′: the difference is therefore only 3 minutes, which the ſhip was leſs to the weſtward the laſt day of this period than the firſt.

2. From the 24th of June when the Solide had reached the latitude of 8° ſouth, till the 7th of Auguſt when ſhe arrived at the latitude of 57° 18′

* I take for the *Difference* from the 24th of June to the 20th of July, that of 1° 46′, becauſe this is the error (uncorrected) with which the progreſs in longitude, eſtimated in the interval of theſe two days, was really affected, whatever was the cauſe of it.

north,

north, between meridians, the moſt weſtern of which is 1° 10′ to the weſt, and the moſt eaſtern 2° 34′ to the eaſt, of the 142nd meridian weſt from PARIS, the currents, for forty-four days, conſtantly carried the ſhip to the northward beyond her apparent progreſs.

The daily quantity of this movement varied according to the following indications:

From 8° ſouth of the equator, the unperceived movement towards the north was 12—10—15— and 13 miles in twenty-four hours:

From the equator to 12° north, 10—5—5—2—11—6—6 miles:

From 12° to 14° 30′, little differences of 3 and 4 miles took place in a contrary direction to the former:

From 14° 30′ to 26°, the movement towards the north was 6—9—6—3—16—5 miles per day:

From 26° to 28° 40′, no difference:

From 28° 40′, a difference, in a contrary direction, of 11 miles:

From 28° 40′ to 32°, the daily movement towards the north, 5 or 6 miles:

From 32° to 34°, 21 miles towards the north:

From 34° to 42° 40′, 7—8—13—9—15 miles towards the north:

From 42° 40′ to 43°, 1 mile in a contrary direction:

From 43° to 44°, 8 miles towards the north:

From 44° to 55° 1—2$\frac{2}{3}$ miles towards the same side:

Lastly, from 55° to 57° 15′, on approaching the coast, 13 miles a day, towards the north.

If we sum up the daily and unperceived progress towards the north, which took place, in forty-four days, between the parallel of 8° south and that of 57° north, in a run of 65° or 1300 leagues in latitude, we shall find that the sum of these unperceived progresses, occasioned by the action of the currents towards the same side*, is 253 miles or 84$\frac{1}{3}$ leagues; and on taking a mean term, 5$\frac{3}{4}$ miles, or near 2 leagues in twenty-four hours.

Some little differences observed in the course of this period of forty-four days, which indicate an accidental tendency of the waters towards the *South*, deserve no consideration; for it is not proved that the greater part of these differences do not belong to the observation of latitude, which, as is well known, may leave an uncertainty of 2 or 3 minutes in its result, when the observation is made with a sextant: and we ought not thence to conclude that the general tendency of the waters carried them towards the *North*.

3. It may be remarked too that, from the 22nd of June to the 7th of August, during forty-six days, between the parallels of 9° 20′ south, and

* *See* at the end of the *Notes*, the *Table of the Effect of the Currents, 4th Run.*

57°

57° 15′ north, and between the longitude of 142° 30′ and 139° 30′ weſt (the extreme limits of the progreſs towards the eaſt and towards the weſt), the currents conſtantly carried the ſhip to the weſtward, except on one occaſion (from the 26th of July to the 5th of Auguſt, between 37° 45′ and 55° 15′ of north latitude, and 152° 15′ and 143° 45′ of longitude) when they carried her to the eaſtward, 44 miles in ten days. The ſum of the quantities towards the weſt amounts to 144 miles or 48 leagues; which gives for the mean effect of the currents towards that ſide, a little more than 3 miles in twenty-four hours.

If we combine theſe 144 miles to the weſt with the 253 to the north, we find that the compound direction of the currents was north 29° 40′ weſt, the way made in this direction 291.5 miles or 97.2 leagues, and the mean drift 6.3 miles in twenty-four hours.

Thus, a navigator who might follow the track of Captain Marchand, in the ſame ſeaſon, and who ſhould employ for directing his courſe only the ordinary methods of navigation, might reckon, in general, that the currents carried the ſhip, by an unperceived movement, $2\frac{1}{10}$ leagues per day in the direction of north 30° weſt.

FIFTH

FIFTH RUN,

From the NORTH-WEST Coast of AMERICA to the SANDWICH ISLANDS.

NOTE XL.

On the 21st of August, the SOLIDE took her departure from TCHINKITÂNAY Bay, in latitude 57° 4′ north, and longitude 137° 59′ west.

On the 22nd, the Observations of the moon's distance from the sun gave for the longitude of the ship, reduced to noon, 137° 10′: thus the progress towards the east had been 0° 49′.

The longitude according to the dead reckoning was 137° 16′; the difference of the progress by account towards the east, compared to that which is deduced from observation, is only 6 minutes or 3¼ miles, which the observed progress is greater.

On comparing the latitudes, we find that the progress towards the south is greater according to observation than according to the dead reckoning, by 3 minutes or 3 miles.

Thus, it should appear that the currents set about 4½ miles to the east 42° 30′ south.

NOTE XLI.

On the 23rd, at three-quarters paſt five in the morning, the SOLIDE was in ſight and to the weſtward of the northern part of the weſt coaſt of thoſe lands which LA PÉROUSE diſcovered in 1786, and which, ſubſequently to his diſcovery, Captain DIXON has named QUEEN CHARLOTTE's Iſlands.

On pricking off the ſhip's place on the chart of the Engliſh navigator, Captain MARCHAND deduced from his obſervations of the preceding day, that the middle of the entrance of CLOAK Bay is ſituated in latitude 54° 10′ north, and longitude 135° 50′ weſt from PARIS; and this longitude differs by 10 minutes in exceſs from that aſſigned to it by DIXON's original chart, which places the entrance in 133° 20′ weſt from GREENWICH.

But, according to the obſervations made in the voyage of LA PÉROUSE, we are of opinion that Captain MARCHAND's longitude mentioned in Captain CHANAL's Journal, ought to be increaſed 8 minutes; and on applying this correction to the longitude of the point whence the bearing was taken, which was, at noon, 135° 53′, we have carried this longitude, in the JOURNAL OF THE ROUTE, to 136° 1′.

NOTE XLII.

On the 1ſt of September, at noon, the SOLIDE took her departure from a point from whence bearings were taken of the land in latitude 52° 56′ by obſervation; and Captain MARCHAND had fixed the longitude of this point at 135° 20′, according to the General Chart of the *NORTH-WEST COAST OF AMERICA*, which is prefixed to *DIXON'S VOYAGE*.

But

But the obſervations made in La Pérouse's voyage place in 135° 5′ the portion of the coaſt ſituated in latitude 52° 56′: and, as at the moment of taking the bearings, the Solide was 5 or 6 leagues, or about 30 minutes to the weſtward of the coaſt, the longitude of the point whence the land was ſet will be 135° 35′, that is, greater by 15 minutes than that aſſigned to it by Captain Marchand and the Journal of Captain Chanal.

In conſequence, I have (in the Journal of the Route) increaſed by 15 minutes the longitude of the point whence the bearings of the 1ſt of September were taken; and the longitudes by account of the 2nd, 3rd, and 4th.

NOTE XLIII.

On the 4th, the longitude deduced from the obſervations of the moon's diſtance from the ſun, and reduced to noon, was 130° 40′; and on comparing it with that of the 1ſt corrected, as in the preceding Note, we find that the progreſs towards the eaſt was 4° 55′.

That which was deduced from the dead reckoning compared to the ſame longitude is only 4° 36′: the difference in three days is therefore 19 minutes, or about 12 miles, which the ſhip appears to have been carried to the eaſtward.

In the ſame interval, the progreſs towards the ſouth was greater according to the obſervation than according to the dead reckoning, from the 1ſt to the 3rd, 11 minutes; but from the 3rd to the 4th, it was ſmaller by 4 minutes: thus from the 1ſt to the 4th, the currents, from a compenſation having taken place, ſet 7 minutes, or 7 miles, to the ſouthward.

It

It might be concluded that the ſhip was carried about 14 miles, in three days, at $4\frac{3}{4}$ miles in twenty-four hours, to the eaſt 30° 30′ ſouth.

NOTE XLIV.

On the 8th, before he loſt ſight of the coaſt of AMERICA, Captain MARCHAND took a bearing off BERKLEY Sound.

At half paſt ſix o'clock in the evening, the entrance of this bay bore north-eaſt half eaſt diſtant ſix leagues: and, on ſetting off the bearing on DIXON's Chart, where BERKLEY Sound is placed in latitude 48° 57′ north, and longitude 128° 28′ weſt from PARIS, it was concluded that the point whence the bearings was taken, which was made the *Point of departure*, was ſituated in

Latitude 48° 46′ North.
Longitude 128° 48′ Weſt.

NOTE XLV.

The reſult of the lunar obſervations of the 19th in the morning, reduced to noon, placed the ſhip in longitude 139° 3′; and, on comparing it to that of the point of departure (preceding Note), it will be ſeen that the progreſs towards the weſt was 10° 15′.

According to the dead reckoning, it appears to have been 12° 3′.

Thus in the ſpace of eleven days, the ſhip was carried *aſtern* or to the eaſtward, by the action of the currents, 1° 48′, or 83.6 miles.

She was carried to the ſouthward a ſtill more conſiderable quantity: the daily differences between the latitude by account and the latitude by obſervation, were 2, 4, 8, 9, 15, 16, and 17 minutes; and the ſum of theſe differences is 2° 6′, or 126 miles, which the ſhip was carried towards the ſouth in the interval of eleven days.

On combining theſe quantities towards the ſouth with the quantities towards the eaſt, we find that the currents carried the ſhip by an unperceived movement, 151.5 miles in eleven days, or 13.77 miles in twenty-four hours, to the ſouth 33° 15′ eaſt.

NOTE XLVI.

The progreſs towards the weſt, according to the compared reſults of the obſervations of the 19th and 21ſt, was 2° 30′; and as, according to the dead reckoning, it is only 2° 17′, it may thence be concluded that, in the interval of two days, the unperceived progreſs towards the weſt was 13 minutes or 11.2 miles.

The unperceived progreſs towards the ſouth was, in the ſame ſpace of time, 8 minutes or 8 miles.

And, on combining the two movements, we find that the ſhip was carried 13.8 miles in two days, or 6.9 miles a day, to the weſt 35° 30′ ſouth.

NOTE

NOTE XLVIII.

From the 21ſt to the 23rd, the progreſs towards the weſt was, according to the obſervations, 2° 14′, and 2° 8′, according to the dead reckoning; the difference is 6 minutes or 5.22 miles, which the ſhip appears to have been carried to the weſtward in two days, or 2.6 miles in twenty-four hours.

The difference between the latitudes by obſervation and by account have compenſated for each other, and were only 2 minutes in the one direction, and as much in the other.

NOTE XLVIII.

According to the compared reſults of the lunar obſervations of the 23rd and 30th, the progreſs in longitude towards the weſt, in the interval of ſeven days, was 5° 40′; and the progreſs according to the dead reckoning, was 6° 0′. It follows that the ſhip was carried to the eaſtward, 20 minutes, or 18 miles.

The differences of the latitudes by account, compared to the latitudes by obſervation, counterbalanced each other within 3 minutes, or 3 miles, which the ſhip appears to have been carried to the ſouthward.

On combining the two unperceived movements, towards the eaſt and towards the ſouth, it will be found that the ſhip was carried 18.3 miles in ſeven days, or $2\frac{2}{3}$ miles, in twenty-four hours, to the eaſt 10° ſouth.

NOTE XLIX.

Freſh obſervations for the longitude made on the firſt of October gave for the progreſs towards the weſt, in twenty-four hours, 1° 32′; and the dead reckoning differed from it only 1 minute or 0.93 miles, in exceſs, which it might be imagined that the ſhip had been carried to the eaſtward, if the reſults of the lunar obſervations to which are compared thoſe of the dead reckoning, could attain that preciſion.

The obſervation of latitude proved that, in the ſame ſpace of time, the ſhip had been carried to the ſouthward 5 minutes or 5 miles, beyond her apparent run.

She was therefore carried 5.1 miles to the ſouth $10\frac{1}{2}°$ eaſt.

NOTE L.

By the lunar obſervations which were made on the 3rd, the day before the Solide got ſight of the Sandwich Iſlands, it was concluded that the ſhip had reached the longitude of 155° 7′; and her progreſs towards the weſt, from the firſt of the month, had been 4° 8, greater by 8 minntes, or 7.53 miles than that indicated by the dead reckoning.

The progreſs towards the ſouth, in the laſt two days, was greater according to the obſervations, than according to the reſult of the dead reckoning, by 3 minutes, or 3 miles.

Thus the compound and imperceptible movement had been 8.1 miles, in two days, or 4 miles, in twenty-four hours, to the weſt 21° 45′ ſouth.

NOTE

NOTE LI.

On the 4th at four o'clock in the afternoon, the SOLIDE was exactly under the meridian of the moſt eaſtern point of the Iſland of O-WHYHEE, which the obſervations made in Captain COOK's third voyage* have fixed at 157° 10′ 15″ weſt from PARIS; and the longitude of the ſhip, at that period, ought to have been the ſame as that of this point.

On the 3rd at noon (preceding Note), the longitude of the ſhip deduced from obſervation, was 155° 7′. From the 3rd to the 4th at noon, the dead reckoning indicated a progreſs towards the weſt of 1° 37′; and, from noon to four o'clock in the evening of the latter day, a progreſs of 17 minutes towards the ſame ſide†: thus the longitude deduced from obſervation of the 3rd and increaſed by the progreſs by account towards the weſt, in the interval of 28 hours, was on the 4th at four o'clock in the afternoon, 157° 1′.

It was therefore ſmaller than the true longitude of the point at which ſhe was arrived, and 9¼ minutes aſtern; and the error was 8¾ miles. But it will be ſeen hereafter that this trifling error of 9¼ minutes belongs to the dead reckoning, which, in the interval from noon to three or four o'clock in the afternoon of the 4th, indicates a progreſs towards the weſt too ſmall by this quantity: and if, in theſe twenty-eight hours, the real progreſs of

* See *The Original Aſtronomical Obſervations made in a voyage to the Northern Pacific Ocean*, &c. by W. Bayley, page 350. The longitude of this point is there laid down 205° 10′ weſt from *Greenwich*.

† From noon to four o'clock, the ſhip ſteered weſt 14° 30′ ſouth—weſt 37° ſouth—weſt 31° 30′ ſouth—weſt 19° 15′ ſouth: and ſhe ran 4½ miles on each of theſe courſes.

the

the ſhip had been the ſame as her apparent progreſs, the longitude on making the land would have been preciſely the ſame as that of the eaſt point of O-Whyhee, on the meridian of which the ſhip was placed.

In order to aſcertain the error which occurred in the reckoning, in the interval from noon to three or four o'clock in the afternoon, it will be obſerved that the longitude by account of the 4th at noon (Journal of the Route) was 158° 26′, to which muſt be added the progreſs by account towards the weſt, from noon to four o'clock in the afternoon of the 4th which is 17 miles towards the weſt; and we ſhall have, for the longitude by account at this latter moment 158° 43′. On comparing this longitude to the longitude by account of the 3rd, we find that, according to the dead reckoning, the progreſs towards the weſt, in the interval from noon to three or four o'clock in the afternoon of the 4th, is 1° 54′.

But if we compare the true longitude of the 4th at four o'clock, 157° 10′ 15″ to the longitude deduced from the obſervation of the 3rd at noon, 155° 7′, it is ſeen that the real progreſs was 2° 3′ 15″: thus the error of the dead reckoning was, in twenty-eight hours, 9¼ minutes or 8.66 miles, which it appears that the currents ſet the ſhip to the weſtward.

At the ſame time, they carried her, according to the obſervations, 4 minutes, or 4 miles to the northward: thus the unperceived movement of the ſhip was 9.6 in twenty-eight hours, or 8.2 miles, in the direction of weſt 24° 45′ north.

If, at preſent, we wiſh to find what was, on making the land, the error of the longitude by account deduced by the dead reckoning, during the paſſage, from the longitude of the 8th of September in ſight of Berkley Sound,

we muſt add 1° 54′ (progreſs by account towards the weſt, from noon to three or four o'clock in the afternoon of the 4th) to 156° 49′ (longitude by account of the 3rd at noon; and we ſhall have 158° 43′ for that of the 4th: it is greater than the true longitude, by 1° 3′ 45″, or 87½ miles or 29.2 leagues *ahead.*

It would have been greater by 36¼ minutes, if no compenſation had taken place: it will be ſeen by the following table, that from the 8th of September to the 4th of October, the ſum of the errors *plus* weſt was 2° 9′; but that of the errors *minus* weſt being 36¼ minutes, there remained, deducting the latter, only 1° 32′ 45″ for the former.

Periods of the Observations.	Latitude by Observation North.	Longitude by Observation West.	Progress in Longitude in the interval of the Observations according to Observation.	Progress in Longitude in the interval of the Observations according to the Dead Reckoning.	Differences of the Progress towards the West, according to the Dead Reckoning, compared to the progress according to Observation.	Interval of the Observations.
1791.	° ′	° ′	° ′	° ′	° ′	DAYS.
August	In *Tchinkitânay* Bay.					
From the 21st ..... to the 22nd	57 4 54 35	137 59 137 10	0 49 W.	0 43 W.	— 0 6 W.	1.
September	In sight of *Queen Charlotte's* Isles.					
From the 1st..... to the 4th	52 56 49 1	135 35 130 40	4 55 W.	4 36 W.	— 0 19 W.	3.
	In sight of *Berkley* Sound.					
From the 8th ..... to the 19th	40 48 30 58	128 48 139 3	10 15 W.	12 3 W.	+ 1 48 W.	11.
From the 19th..... to the 21st	..... 29 46	..... 141 33	2 30 W.	2 17 W.	— 0 13 W.	2.
From the 21st ..... to the 23rd	..... 28 30	..... 143 47	2 14 W.	2 8 W.	— 0 6 W.	2.
From the 23rd..... to the 30th	..... 21 2	..... 149 27	5 40 W.	6 W.	+ 0 20 W.	7.
From the 30th..... October to the 1st	..... 19 41	..... 150 59	1 32 W.	1 33 W.	+ 0 1 W.	1.
From the 1st..... to the 3rd	..... 19 14	..... 155 7	8 8 W.	8 00 W.	— 0 8 W.	3.
From the 3rd ..... to the 4th	..... 19 6	..... 157 10¼	2 3¼ W.	1 54 W.	— 0 9¼ W.	1¼.
At four o'clock in the afternoon, on the meridian of the east point of the Island of O-Whyhee.						

It may be remarked, in the run from the NORTH-WEST coast of AMERICA to the SANDWICH Islands, that, when the SOLIDE was standing to the northward, from the 19th to the 57th parallel (between the 13th of July and 7th of August), the currents constantly set to the northward, 2⅓, 3⅔, 21, 7½, 5⅓, and 11½ a day: and that, on the contrary, in running from the 57th to the

the 19th parallel (between the 21ſt of Auguſt and the 4th of October,) they ſet to the ſouthward, 3, 2¾, 11½, 4, 5, and 1 miles a day*.

In the former period, the SOLIDE had ſailed between the 150th and 140th meridian weſt from PARIS; and in the latter, ſhe had ſailed between the 140th and 157th.

It does not appear to me, therefore, that it is to the difference of meridians, which is not very conſiderable, that we ought to attribute the change in the direction of the currents; it would appear rather to depend on the difference of the ſeaſons.

It will be for navigators who ſhall, in the ſequel, ſail in theſe latitudes, at the ſame periods when the SOLIDE croſſed them, to aſcertain whether the direction and the velocity of the currents will again prove the ſame as thoſe which we have thought ourſelves juſtified in deducing from the obſervations for the latitude and longitude made by Captains MARCHAND and CHANAL, in ſtanding up and running down, between the two extreme parallels, which, in the latter period, limit the courſe of the SOLIDE.

* In the laſt twenty-four hours only, they ſet 4 miles to the northward; but the ſhip was then at no great diſtance from the archipelago of the *Sandwich* Iſlands; and it is well known that the channels which ſeparate iſlands, occaſion currents that vary according to the tides, according to the wind which has blown, and whoſe effect is frequently felt at rather conſiderable diſtances from the lands between which they have begun to form.

SIXTH RUN,

From the SANDWICH Islands to the MARY-ANNE Islands and to MACAO.

NOTE LII.

On the 7th, at six o'clock in the evening, a last bearing was taken of the Island of O-Whyhee, in order to fix the point of departure, at that moment, the two extremities in sight bore from north 5° east to east-south-east 2° 30′ east; and the ship was at the distance of two leagues from the nearest shore. From these bearings was fixed the

Point of Departure	Latitude.....	19° 4′ North
	Longitude....	158 29 West.

NOTE LIII.

The result of two sets of distances of the sun and moon, observed on the 19th at forty-two minutes after nine in the morning, gave for the longitude of that day at noon 178° 48′ west from Paris; and on comparing it to that of the point of departure, we have for the ship's progress towards the west in the interval of 11¾ days, 20° 19′.

The progress, according to the dead reckoning, was only 18° 54′: thus the currents had driven the ship to the westward 1° 25′, or 81½ miles.

In the ſame ſpace of time, except the 2nd, 3rd, and 4th day of the period, the currents had conſtantly carried the ſhip to the ſouthward, and this movement had been ſometimes 10, 11, and 15 miles in twenty-four hours; but from the 8th to the 9th of the month, the unperceived movement had been 10 miles towards the north, and, from the 9th to the 10th, it was 29 miles towards the ſame ſide: in theſe two days the ſhip had ſailed between the latitude of 19° 30′ and 20° north, and between the longitude of 159° 40′ and 160° 40′ weſt.

On deducting the ſum of the unperceived movement towards the north, from the ſum of the movement towards the ſouth, we find as the reſult, that the ſhip, in the courſe of the period, had been carried, 12 minutes, or 12 miles to the ſouthward.

And on combining the movement towards the ſouth, with that which the obſervations for the longitude indicated towards the weſt, it will be ſeen that the ſhip was carried 82.5 miles in $11\frac{3}{4}$ days, or about 7 miles in twenty-four hours to the weſt 8° 20′ ſouth.

NOTE LIV.

The reſult of the lunar obſervations, made on the 20th, confirmed that of the obſervations of the 19th.

The progreſs towards the weſt in the twenty-four hours had been 1° 31′ according to the obſervations, and 1° 25′ according to the dead reckoning; the difference of 6 minutes or 5.8 miles, in defect, on the ſide of the reckoning, would indicate that the currents may have carried the ſhip to the weſtward that quantity; at the ſame time that the obſervation of latitude

 announces

announces that they effected no change in the ſhip's courſe in the direction of the latitude.

NOTE LV.

The progreſs to the weſtward, from the 20th to the 23rd, was, according to the obſervations, 7° 8′, while, according to the dead reckoning, it ought to have been only 5° 54′: the currents therefore drove the ſhip, in three days, 74 minutes, or 72 miles, to the weſtward: this is at the rate of 1 mile an hour, or 8 leagues a day.

The effect of the currents was nearly null in the direction of the latitude: 2 minutes to the ſouthward, the firſt day; 2 minutes to the northward, the ſecond; no difference, the third: thus, the little effect of the currents, if this effect be real and belong not to ſome ſmall errors in the obſervations, was counterbalanced and done away in the courſe of the period.

NOTE LVI.

The currents continued to ſet to the weſtward from the 23rd of October to the 2nd of November.

On comparing the reſult of the obſervations for the longitude of the latter day, with that of the obſervations of the former (172° 33′ with 148° 14′) it is ſeen that, in the interval of ten days, the progreſs by obſervation towards the weſt, 24° 19′, exceeded by 1° 39′, or 97 miles, the progreſs by account which was only 22° 40′.

The

The effect of the currents, ſometimes towards the north, ſometimes towards the ſouth, was inconſiderable, and, after having ſubtracted the one from the other, is reduced to 3 minutes, or 3 miles towards the north.

The compound effect is 97 miles in ten days, or 9.7 miles in twenty-four hours, to the weſt 1° 40′ north.

NOTE LVII.

Two ſets of diſtances obſerved on the 2nd, at twenty-ſeven minutes after two in the afternoon, and reduced to noon, had given 148° 14′ for the longitude (preceding Note.)

Two other ſets obſerved on the 4th, at one minute after five in the evening, gave for the longitude at noon of that day, 144° 34′.

On comparing this latter longitude with the former, it will be found that, according to the obſervations, the ſhip's progreſs towards the weſt in two days, would have been only 3° 40′.

But, according to the dead reckoning, the progreſs towards that ſide is 4° 23′; which would imply that, in 48 hours, the ſhip had been carried *to the eaſtward*, 43 minutes, or 41.6 miles, that is, about ſeven leagues a day. This extraordinary effect of the movement of the waters which, between the tropics, conſtantly ſet to the weſtward, unleſs the vicinity of ſome great land or of an archipelago occaſion a change in their direction, ſuggeſted the idea that there might be an error in the obſervations of the 2nd or in thoſe of the 4th; and our navigators determined to take a mean between the reſults combined

combined with the progreſs which had been deduced from the calculation of the ſhip's run.

According to this calculation, the progreſs towards the weſt, from the 2nd to the 4th, was 4° 23′: on deducting this quantity from the longitude by obſervation on the 2nd and reduced to noon of that day, there remains for that of the 4th at noon, 143° 51′. Now, if we take a mean between this longitude and that which the obſervations gave for the ſame period, we ſhall have 144° 12′ 30″, a longitude which partakes both of the obſervations of the 2nd and 4th, and of the progreſs by account in the interval of theſe two periods.

From noon to three quarters paſt five o'clock in the evening of the 4th, the progreſs by account towards the weſt was 35 minutes: and on ſubjecting it to the longitude obſerved and corrected of the ſame day at noon, which was 144° 13′; we have for the longitude of the ſhip at three quarters paſt five o'clock, 143° 38′.

At the ſame moment, the Iſland of TINIAN (of the archipelago of the MARY-ANNE Iſles) bore from weſt ſouth-weſt half weſt to north-weſt by weſt, diſtant two leagues.

The iſland was therefore about 5 minutes to the weſtward of the ſhip; and on deducting this quantity from the longitude at three quarters paſt five, we ſhall have for that of TINIAN, 143° 33′.

Obſervations made, in 1767, by Captain WALLIS, on board the DOLPHIN, give for the longitude of this iſland 143° 34′ 45″*: the difference

* See *Aſtronomical Obſervations made in the Voyages for making Diſcoveries in the ſouthern Hemiſphere,*

ence between the one determination and the other is therefore only 3 minutes.

If we wiſhed to take the mean longitude obſerved of the 4th at noon, 144° 13′, for the term of compariſon, and we compare to it the longitude obſerved of the 2nd at noon, it will be found that, in forty-eight hours, the progreſs towards the weſt was 4° 1′: but the progreſs by account is 4° 23′: thus the ſhip appears to have been carried to the eaſtward by an unperceived movement or has advanced leſs to the weſtward than her apparent progreſs indicated, 22 minutes, or 21¼ miles.

In the ſame ſpace of time, ſhe was carried 7 minutes to the northward, from the 2nd to the 3rd, and 3 minutes to the ſouthward, from the 3rd to the 4th: there remains a movement to the northward of 4 minutes, or 4 miles.

On combining the effect of the action of the current, we find that there was an unperceived movement of 21¾ miles in forty-eight hours, or 10.87 miles, a day, to the eaſt 11° north.

NOTE LVIII.

The longitude deduced from the obſervations of the 16th and reduced to noon, is 122° 6′; and on comparing it to the longitude obſerved and corrected of the 4th at noon, it is ſeen that the progreſs towards the weſt was 22° 7′.

Hemiſphere, by W. Wales, London, 1788. 4to. *Introduction*, page x. Mr. *Wales* gives for the longitude of *Tinian* 214° 4′ weſt from *Greenwich*, 143° 35¾′ weſt from *Paris*.

It was only 19° 54′, according to the dead reckoning; and the difference 2° 13′, or 126¾ miles, is the quantity which the ſhip was carried to the weſtward by an exceſs of the real progreſs beyond the apparent.

In the period of twelve days, the effect of the currents on the latitude preſents variations ſomewhat conſiderable: from the 4th to the 8th, they carried the ſhip to the northward 17, 4, 5, and 16 minutes in twenty-four hours; from the 8th to the 10th, 9 and 5 minutes to the ſouthward; from the 10th to the 12th, 7 and 2 minutes to the northward; from the 13th to the 14th, 8 minutes to the ſouthward; from the 14th to the 15th, 8 minutes to the northward; laſtly from the 15th to the 16th, 16 minutes to the ſouthward. After having ſubtracted the ſum of the errors on the one ſide, from that of the errors on the other, there remain 21 minutes, or 21 miles to the northward.

Theſe 21 miles combined with the 126¾ miles towards the weſt, produce a compound and unperceived movement of 128 miles in twelve days, or 10¾ miles in twenty-four hours, to the weſt 9° 30′ north.

NOTE LIX.

On the 18th at noon, the ſouth-weſt point of the Iſland of Formosa bore eaſt-north-eaſt half north, diſtant four leagues and a half. The ſhip was therefore leſs to the northward than this point by 6′ 1″, and leſs to the eaſtward, by 12′ 21″.

The latitude of the ſhip obſerved at the ſame inſtant, was 21° 48′; and it may be concluded that the latitude of the point of Formosa is 21° 54′. It is 22° 2′ on the Chart of the *China Sea*, conſtructed in the voyage of

La

La Pérouse, if we there take the difference of the parallel of this point in regard to the ſouth-eaſt point of the great Botel-Tabago-Xima the poſition of which is fixed by the obſervations made in that voyage: Alexander Dalrymple places the ſouth point of Formosa, on the Chart of the *China Sea*, publiſhed in 1771, in latitude 22° 2′ 30″. I preſent theſe differences only for the purpoſe of inducing navigators to aſcertain which of the latitudes ought to be adopted.

In order to eſtabliſh the true longitude of the ſouth-weſt point of Formosa, which is now to ſerve as a term of compariſon to which we ſhall reduce the calculations of the Solide's run from the Sandwich Iſlands to abreaſt of this point, I obſerve that the ſouth eaſt point of the great Botel-Tabago-Xima is ſituated, according to the obſervations made in La Pérouse's voyage, of which I take the liberty of making uſe by anticipation, in 119° 32′ eaſt longitude; and that, on the chart of the *China Sea* conſtructed in this voyage and intended to form a part of the Atlas which will accompany the narrative, the ſouth-weſt point of Formosa is leſs eaſterly than the ſouth-eaſt point of the Great Botel, by 52 minutes: the longitude of the point of Formosa is therefore 118° 40′.

But on the 18th of November, at noon, the Solide, according to the bearings of the land, was 12⅓ minutes leſs to the eaſtward than the point of Formosa: the longitude of the ſhip, at this period, was therefore 118° 27′ 40″.

Let us firſt ſee what was the error of the dead reckoning in the interval compriſed between the obſervations for the longitude made on the 16th and the land-fall on the 18th.

The longitude deduced from the obſervations of the 16th was (preceding Note) 122° 6′: that which was deduced from the bearings of the 18th is 118° 28′ (in round numbers): thus, in the interval of forty-eight hours, the ſhip's progreſs towards the weſt was 3° 38′. But, according to the dead reckoning, this progreſs appeared to be only 3° 34′: and the difference of 4 minutes, or 3.72 miles, is the quantity which it may be ſuppoſed that the currents carried the ſhip to the weſtward.

During the ſame time, they carried her, according to the obſervations of latitude, 17 minutes, or 17 miles, to the northward.

The compound movement of the ſhip out of her apparent courſe, was therefore 17.4 miles in two days, or 8.7 miles in twenty-four hours, to the north 12° 30′ weſt.

As the SOLIDE's voyage, on leaving the ſouth-weſt point of FORMOSA, no longer preſents any point of compariſon till her arrival at MACAO, and as, in ſight of this point, the calculations of the dead reckoning, made during this latter part of the run, are rectified, I can ſuppoſe it terminated on the 18th of November; and I ſhall examine what was, on making the land of FORMOSA, the error of the longitude deduced from the obſervations of the 16th, and what was the error of the longitude deduced from the dead reckoning ſince her departure from the SANDWICH Iſlands.

The longitude of the ſhip, on the 16th at noon, according to the obſervations made on that day, of 122° 6′ eaſt; and the progreſs by account towards the weſt, from the 16th at noon, to noon of the 18th, the period of the bearings being taken off the Iſland of FORMOSA, is 3° 34′: thus the longitude of the SOLIDE, on the 18th at noon (according to the reckoning of a courſe

of forty-eight hours, deduced from the reſult of the obſervations of the 16th) was 118° 32′. We have ſeen that her true longitude deduced from the bearings was 118° 28′: the ſuppoſed longitude was therefore in error only 4 minutes, or about 1¼ leagues *aſtern* of the true; I ſay *aſtern*, relatively to the courſe of the ſhip which was ſailing towards the weſt.

Let us ſee, at preſent, what would have been the error on making the land, if, in order to regulate the courſe of the SOLIDE, aſtronomical obſervations had not been made uſe of, and if the ignorance of the captain had condemned him to employ only the ordinary methods of navigation.

The longitude deduced from the dead reckoning from the point of departure taken from the SANDWICH Iſlands, on the 7th of October, was, at the moment of the bearings being taken off the Iſland of FORMOSA, on the 18th of November, 124° 47′: and as we have ſeen that the true longitude of the ſhip, at that period, was 118° 28′, it follows that after 41¼ days' navigation, the longitude by account was in error, *aſtern* (ſince it is eaſt) 6° 19′, which, in the parallel of the point arrived at, anſwer to a little more than 117 leagues.

The following Table preſents the partial errors of the dead reckoning, ſuch as they may be reckoned in each of the periods which divide the run, conſidering the reſults of the obſervations for the longitude made at the extreme limits of each period, as fixed points of compariſon.

Periods of the Observations.	Latitude by Observation North.	Longitude by Observation West.	Progress in Longitude in the interval of the Observations accordg. to Observation.	Progress in Longitude in the interval of the Observations accordg. to the Dead Reckoning.	Differences of the Progress towards the West accordg. to the D. Reckoning compared to the Progress according to Observation.	Interval of the Observations.
1791.	° ′	° ′	° ′	° ′	° ′	DAYS.
October	In sight of the Island of *O-Whybee*.					
On the 7th at 6 P. M.	19 4	158 29	20 19 W.	18 54 W.	— 1 25 W.	12.
From the 7th to the 19th	13 33	178 48				
		East.				
From the 19th to the 20th	13 32	179 41	1 31 W.	1 25 W.	— 0 6 W.	1.
From the 20th to the 23rd	13 40	172 33	7 8 W.	5 54 W.	— 1 14 W.	3.
From the 23rd November to the 2nd	14 26	148 14	24 19 W.	22 40 W.	— 1 39 W.	10.
From the 2nd to the 4th	14 50	144 13	4 1 W.	4 23 W.	+ 0 22 W.	2.
From the 4th to the 16th	21 34	122 6	22 7 W.	19 54 W.	— 2 13 W.	12.
From the 16th to the 18th	21 48	118 28	3 38 W.	3 34 W.	— 0 4 W.	2.
	In sight of the South-west point of the Island of *Formosa*.					

It is seen that, except in the interval from the 2nd to the 4th of November, during which the ship appears to have been carried to the *eastward**, the currents, in all the other periods of the run, constantly set to

* This effect of the currents is extraordinary: perhaps it ought to be attributed to an error in the observations of the 2nd or in those of the 4th. It has been seen (page 317) that, but for the correction which it was thought proper to make, and which is justified by the precision of the land-fall on *Formosa*, the effect would have been 43 minutes or about 42 miles in two days, or 7 leagues in twenty-four hours. Perhaps too, if we observe that it took place between the 148th and the 144th meridian, on approaching the *Mary-Anne* Islands, situated in 143° 30′, we might suppose that the waters, after having been impelled by the general current, and heaped up, if we may use the comparison, in the great gulf which spreads between the Islands of *Japan* and those of *New Guinea*, flow back in a contrary direction, and crossing the archipelago of the *Mary-Anne* Islands, the range of which extends on a meridian, acquire, by their confinement in the channels between those islands, a velocity towards the east, which is full as far as 4 or 5 degrees beyond the meridian of that archipelago. I present this idea only as a bold conjecture.

the

the *weſtward*. The ſum of the imperceptible movements towards that ſide, deducting that which was made towards the eaſt, amounts to 6° 19′, or 351.6 miles. If this quantity be divided by the number of the days, 41¾, it will be found that the mean effect of the currents carried the ſhip to the weſtward 8.4 miles in twenty-four hours. It is well known that this movement of the waters, from eaſt to weſt, is conſtant between the tropics, in croſſing the GREAT OCEAN.

SEVENTH RUN,

From MACAO to the Iſle of FRANCE.

NOTE LX.

It has been ſeen in the Narrative, that the SOLIDE having ſailed from MACAO on the 6th of December, on the 11th made the iſlots called the Two BROTHERS, and ſucceſſively the group of PULO-SAPATA: this unexpected land-fall, at the time when Captain MARCHAND reckoned that he had ſtill a rather long run to make before he ſhould be near enough to perceive them, gave him reaſon to think that they are carried too far to the weſtward, in regard to MACAO, on the *Chart of the China Sea*, publiſhed in 1771 by ALEXANDER DALRYMPLE, and on the copy which D'APRÈS has given of it in the ſecond edition of his *Neptune Oriental*. As it is by this chart that all the French navigators regulate their courſe in this ſea, I have conceived that it would be uſeful to examine the queſtion; to ſee whether the

the modern voyages did not furniſh us with data ſufficient for determining, with the preciſion required for the ſafety of navigation, the difference of meridian which ought to be admitted between MACAO and PULO-SAPATA, and to compare to it that at which theſe two points are placed on Mr. DALRYMPLE's chart.

1. BBYLY, the aſtronomer, in COOK's third voyage, obſerved diſtances of the ſun and moon, in the TYPA (MACAO ROAD) on the 2nd, the 28th, and the 29th December 1779, and on the 13th of January 1780. Theſe four ſets of obſervations furniſhed him with ſixteen particular reſults, the extremes of which differ 52 minutes. On combining theſe ſixteen reſults with thoſe of the lunar obſervations which he had taken at ſea, before and after the ſhip's arrival in the TYPA, and which he reduced to this road by means of a good chronometer, he, by a mean between all theſe reſults, fixed the longitude of the TYPA at 113° 37′ 15″ eaſt from GREENWICH*: and as, according to the ſame aſtronomer, the town of MACAO is more eaſterly than the TYPA by 1 minute†, it reſults that, according to his obſervations, the longitude of MACAO is 113° 38′ 15″.‡

Lunar obſervations, made at the ſame period in the TYPA by different officers belonging to the RESOLUTION, furniſhed thirty-ſix other reſults the extremes of which differ 1° 45′ 30″; and the mean reſult, after having been combined with that of fourteen other obſervations, made before and after the ſhip's arrival, gave for the longitude of the TYPA 113° 48′ 34″ eaſt from GREENWICH; and 113° 49′ 34″ for that of MACAO.

* The *original aſtronomical obſervations made in a voyage to the Northern Pacific Ocean.* By W. Bayly. page 77.

† *Ibid*, page 76.

‡ *Ibid*, page 78.

The

The mean between the mean results of two sets of observations made in Cook's voyage, would therefore be for Macao 113° 43′ 54½″: but as the observations of the first set agree better with each other than those of the second, it is expedient to place greater confidence in them; and we may admit for the *mean result of the two sets*, 113° 40′ east from Greenwich.

We may also determine the longitude of Macao by its difference of meridian from Canton.

2. George Robertson, in the excellent Memoir which he has published for the elucidation of his large *Chart of the China Sea* (1771) gives an account of various observations from which he has determined the longitude of Canton*:

By the observations of the Hon. Thomas Howe, (Determined by the emersion of *Jupiter's* first satellite) .... 113° 33′ 00″
Ditto of Captain Joseph Huddart (emersion of *Jupiter's* first satellite).....113° 16′ 00″
By a great number of observations made by Henry Brown, during his long residence at Canton, as Supercargo....113° 10′ 00″
By the observations of Captain Lestock Wilson, by time-keeper made by Arnold..... 113° 21′ 15″

The result of the Hon. Thomas Howe differs too much from the other three for it to be admitted†.

The mean of these would give.....113° 15′ 45″

But

* *Memoir of a Chart of the China Sea.* London, 1791. 4to. page 2.

† *Robertson* observes that the Hon. *Thomas Howe* has determined the latitude of *Canton* at 22°

But if we are willing to adhere to a mean result between Mr. BROWN's longitude and that of Captain HUDDART, both deduced from the emersion of JUPITER's first satellite, we shall have 113° 13′ 00″ east from GREENWICH, or 110° 52′ 45″ east from PARIS*.

The difference of meridian between CANTON and MACAO was determined by three different chronometers†.

By Mr. HENRY BROWN, at different times.....18′ W.
By Captain WILSON, outward bound.....17′
By Ditto.....homeward bound.....16′
By Captain JOSEPH HUDSON.....16′
Difference of meridian by a *mean* (MACAO east).....16′ 45″

If we add this difference to the longitude of CANTON 113° 13′ east from GREENWICH, we shall have for the longitude of MACAO (in round numbers) 113° 30′.

We had, farther back, by the observations in COOK's voyage....113° 40′
Longitude of MACAO by a *mean*.....113 35
(or 111° 14′ 45″, and 111° 15′ in round numbers, east from the meridian of PARIS‡.)

3. The

22° 52′ 50″; and that Captain *Joseph Huddart* and Captain *Lestock Wilson*, both excellent observers, make it, the former 23° 6′ 57″, and the latter, 23° 6′ 53″: which differs near 15 minutes from that of Mr. *Howe*; and he adds that "if in Mr. *Howe's* latitude there is so great "an error there is reason to conclude that the longitude by the same observer cannot be exact."

* The *Connaissance des Temps* (Nautical Almanac) of the year VIII. of the French era, 1800, gives for the longitude of *Canton*, 110° 42′ 30″: this is the mean result of seven emersions of the first satellite, observed towards the end of the last century by Father *Fontenay*, a Jesuit, for which there were no correspondent observations in Europe.

† *G. Robertson's Memoir*, page 9.

‡ The longitude of *Macao* is likewise 111° 15′ in the French nautical almanac or *Connaissance des*

3. The third voyage of Captain Cook furniſhes us with obſervations which may ſerve to determine the difference of meridian between Macao and Pulo-Sapata.

The obſervations of the aſtronomer Bayly, and a chronometer whoſe rate was aſcertained ſeven days before at Macao, gave for the longitude of Pulo-Sapata eaſt from Greenwich* 109° 16′, and thoſe of Captain King 109° 10′†: the mean is 109° 13′:

And as it has been ſeen (farther back, Remark 1ſt) that the mean reſult of all the obſervations of Cook's voyage made in the Typa, placed Macao 113° 40′ eaſt from Greenwich, it follows that the chronometer indicated for the *difference of meridian of PULO-SAPATA*, 4° 27′ *weſt from MACAO.*

We may ſeek this difference by another method.

The obſervations made in the third voyage of Captain Cook during the ſtay of the Resolution and Discovery at Pulo-Condore, give us for the longitude of that iſland ‡:

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des Temps; but the reſult was obtained by another means; for it has been ſeen (preceding Note) that it places *Canton* about 10 minutes leſs to the eaſtward than the determination which we have adopted.

* *The Original Aſtronomical Obſervations*, &c. page 351.

† *Cook's third voyage*, Vol. III. page 449. *King* ſays that his obſervations compared with Mr. *Bayly's* time-keeper, place *Pulo-Sapata* in longitude 109° 10′ eaſt from *Greenwich*; and he adds that, during the laſt three days, the ſhips had outrun their reckoning at the rate of twenty miles a day: as he could not attribute the whole of this to the effects of a following ſea, he imputed it in part to a current, which, according to his own calculation, had ſet forty-two miles to the ſouth-ſouth-weſt, between the noon of the 19th and the noon of the 20th of January.

‡ *The Original Aſtronomical Obſervations*, &c. pages 79 and 80.

By a mean between 49 results of obſervations of the moon's diſtance from the ſun or ſtars (the extremes differing 1° 23′ 15″) made by Captain KING and another officer, we have for the longitude of PULO-CONDORE, eaſt from GREENWICH ....106° 18′ 46″

By a mean between 22 results of ſimilar obſervations (the extremes differing 0° 40′ 7″) made by the Aſtronomer BAYLY, we have.....106° 44′ 29″

By a *mean* between all.....106° 31′ 38″

On the other hand, we have the eaſtern difference of meridian of PULO-SAPATA, in regard to PULO-CONDORE:

	°	′	″
By BAYLY's Chronometer*	2	31	31
By that of Captain HODGSON†.....	2	39	00
And by a *mean*.....	2	35	15

If we add this difference of meridian to the longitude of PULO-CONDORE, 106° 31′ 38″, we ſhall have for the longitude of PULO-SAPATA, 109° 00′ 53″: and, on comparing it to that which we have adopted for MACAO, which is 113° 35′ eaſt from GREENWICH, we ſhall find for the *difference of meridian of PULO-SAPATA* 4° 34′ 7″ *weſt from MACAO.*

A third method preſents itſelf to us for determining this difference; and G. ROBERTSON furniſhes us with it in his *Memoir of a Chart of the China Sea.*

* *The Original Aſtronomical Obſervations,* pages 79 and 351—*Pulo-Condore* 106° 44′ 29″; *Pulo-Sapata,* 109° 16′ by the obſervations of Mr. *Bayly.*

† *Robertſon's Memoir,* page 7.

On

On the one hand, the longitude of PULO-AOR is determined by ſeveral obſervations; and other obſervations give us its difference of meridian from PULO-SAPATA: we may thence deduce the longitude of the latter; and on comparing it with the longitude which we have given for MACAO, we ſhall find for their difference of meridian:

For the longitude of PULO-AOR, eaſt from GREENWICH, according to Mr. WILLIAM BROWN, 1767, ſun and moon, mean of 3 obſervations.... 104° 35′

Captain JOSEPH HUDDART, by chronometer * 104 40

Cook's third voyage, by a chronometer regulated at MACAO 19 days before. { By BAYLY's obſervations † 104° 43′.. / By thoſe of KING, &c. ‡ 104 40 .. } 104 40

Captain WILSON, from MACAO, by chronometer..... 104 40

Ditto..... from BATAVIA, ditto..... 104 40

GEORGE ROBERTSON, from MADRAS, by chronometer..... 104 36

By a mean between 7 Reſults: *Longitude of PULO-AOR, eaſt from GREENWICH*..... .... 104 38$\frac{2}{7}$

Or rather in adhering to the four reſults which agree to a minute 104 40

But, according to the account of G. ROBERTSON, page 7 of his *Memoir*, " by admitting PULO-AURO's extreme eaſtern longitude 104° 40′ " from it up to PULO-SAPATA, the meridian diſtance is 4° 14′ meaſured " by a well-regulated box-chronometer, made by ARNOLD, having this " advantage of the iſlands bearing due north, when the altitudes for time

* *Robertſon's Memoir*, page 20.

† *The Original Aſtronomical Obſervations*, page 351.

‡ *Cook's third voyage*. Vol. III. page 466.

 " were

" were made, ſo that no error could ariſe in the eſtimation of diſtance. " which is more frequently the cauſe of difference in obſervation, than any " error in the obſervations themſelves*."

If we add the 4° 14 meridian diſtance to the longitude of PULO-AOR, which we have fixed at 104° 40′, we ſhall have for the longitude of PULO-SAPATA, eaſt from GREENWICH, 108° 54′.

And, on comparing this longitude to that which we have adopted for MACAO, 113° 35′ eaſt from GREENWICH, we ſhall have for the difference of meridian from PULO-SAPATA 4° 41′ weſt from MACAO.

We have therefore three reſults for this difference of meridian:

The firſt, by the obſervations of COOK's third voyage, made at MACAO and PULO-SAPATA (page 329)	4° 27′
The ſecond, by the longitude of PULO-SAPATA, deduced from that of PULO-CONDORE, and compared to our longitude of MACAO (page 330)	4 34
The third, by the longitude of PULO-SAPATA, deduced from that of PULO-AOR, and compared to that which we have admitted for MACAO (as above)	4 41
The difference of meridian between PULO SAPATA and MACAO, by a mean between all, will be	4 34†

4. Let

* *G. Robertſon's Memoir,* page 7.

† The abſolute longitude of *Pulo-Sapata* eaſt from *Greenwich,* deduced from the various differences

4. Let us now compare this difference of meridian, the mean result of a great number of obſervations combined in which the errors of the one muſt have compenſated for thoſe of the other, with the difference which the *Chart of the China Sea* by Mr. DALRYMPLE has given between PULO-SAPATA and MACAO.

On this chart, MACAO is placed 3° 22′ 30″, and PULO-SAPATA 8° 57′ weſt from the meridian of the Iſland of BANGUEY: thus PULO-SAPATA is there laid down 5° 24′ 30″ weſt from MACAO: but as this difference of meridian ought, according to the obſervations, to be only 4° 34′, the error of the poſition of PULO-SAPATA, in regard to MACAO, on Mr. DALRYMPLE's chart, would therefore be 50½ minutes, which this iſland is there carried too far to the weſtward.

In attributing this error to the chart, I ſuppoſe, as I ought, that the difference of meridian between the two points compared, ſuch as I have deduced it from a mean between ſeveral reſults of obſervations, is ſufficiently exact; but it may be remarked that the SOLIDE having ſailed from MACAO,

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ferences of meridian weſt from *Macao* will be as follows, admitting *Macao* to be 113° 35′ eaſt from *Greenwich*:

	° ′	° ′
By the 1ſt difference	4 27	109 8
By the 2nd	4 41	108 54
By the 3rd	4 34	109 1
Longitude of *Pulo-Sapata*, by a mean		109 1
Difference of meridian, by a mean		4 34
Longitude of *Macao*		113 35

Robertſon, in his Table of Poſitions (page 81 of his Memoir) places *Macao* in 113° 30′—*Pulo-Sapata* in 108° 55′; and on his *Chart of the China Sea*, *Macao* is laid down in 113° 30′, and *Pulo-Sapata* in 108° 52′; the difference of Meridians is by the *Table*, 4° 35′, and by the *Chart*, 4° 32′.

and

and made a direct course in order to get sight of PULO-SAPATA, fell in with it much sooner than she ought to have done, if the difference of meridian was as great as it is on Mr. DALRYMPLE's Chart; and the calculation of the SOLIDE's run, regard being had to the effect of the currents, gives this difference nearly the same as that which results from the observations: most assuredly, this is not a decisive proof of the exactness of this determination; but it is at least an additional presumption which must induce French navigators who shall make use of DALRYMPLE's chart (or that of D'APRÈS which is the Copy of it), for regulating their course in going from MACAO to PULO-SAPATA, to keep a good look-out when the chart places their ship, at no more than a degree to the eastward of that island.

I observe that, as it is probable that the islots THE TWO BROTHERS have been subjected on the chart to the position of PULO-SAPATA, they ought to be carried with the island about 50 minutes to the eastward.

French seamen will not have these corrections to make, if they use the *Chart of the China Sea* published by G. ROBERTSON, which has been constructed from the observations which the English navigators have multiplied so usefully in these latter times, and which require to be so still in order to fix with the same certainty the relative position of that considerable number of scattered islots, overfalls, and dangers of all kinds which obstruct the CHINA SEA.

If there is matter for astonishment, it is that Mr. DALRYMPLE should have been able to make so good a chart as that which he published in 1771, with courses and distances by account, always so uncertain in the midst of currents, and yet these were the only data that he then had at his disposal.

Since the discussion into which I have entered, in order to succeed in determining the difference of meridian of PULO-SAPATA in regard to MACAO has led me to inquire into the positions of some points of the CHINA SEA, it will not be useless to French navigators who neither possess G. ROBERTSON's Memoir nor Chart, to compare the positions which I give to these points, both with those which he assigns to them in his TABLE, and with those which are to be found in the CONNAISSANCE DES TEMPS (Nautical Almanac) of the year VIII of the French era.

		Result of the Discussion.	Robertson.	Connaissance des Temps.
		° ′ ″	° ′ ″	° ′ ″
MACAO.....	Lat. N.	22 11 31	22 12 00	22 12 44
	Long. E.	111 15 00	111 9 45	111 15 00
PULO-CONDORE..	Lat....	8 40 00	8 40 00	8 40 00
	Long...	104 11 23	103 57 45	104 11 37
PULO-AOR.....	Lat....	2 42 00	2 29 30	2 42 00
	Long...	102 19 45	102 17 45	102 20 00
PULO-SAPATA....	Lat....	10 4 30	10 1 30	10 4 30
	Long...	106 40 45	106 34 45	106 53 00

1. MACAO. The latitude which is given to it in the *Connaissance des Temps* is 22° 12′ 44″; and according to a note which was formerly communicated to me by Citizen MÉCHAIN, Astronomer of the Navy, Member of the National Institute and of the Board of Longitude of FRANCE, it appears that this latitude is founded on the meridian altitude of the sun, taken in the College, on the 17th of June 1685, by Father THOMAS, a Jesuit, with a gnomon

a gnomon of 48 feet*. Father Gouïe† made it only 22° 12′ 14″; but Father Chausseaume, who obſerved this latitude at the College of St. Paul, in the ſummer ſolſtice of 1753, by a gnomon of 25 feet, carefully ſet up, found it 22° 12′ 40″: and in 1712, Fathers Ureman and d'Alcui had found it 22° 13′ 00″.

The obſervations made in Cook's third voyage gave for the latitude of the Typa 22° 9′ 22″; and W. Bayly ſays that the Typa is leſs northerly than Macao by 3 minutes: the latitude of Macao would therefore be 22° 12′ 22″. I know not why, according to the ſame data, W. Bayly has made it only 22° 12′ 00″‡.

G. Robertson (page 3 of his Memoir) has made it from his own obſervations 22° 12′ 00″, and he ſays that they have been corroborated by thoſe of Captains Fraser, Cumming, and others.

If we take a mean between the ſeven determinations which I have juſt mentioned, we ſhall have 22° 12′ 31″ for the north latitude of Macao; and this it is which I have have adopted.

I have determined its longitude at 111° 15′ 00″ eaſt from Paris (page 329 of this Vol.) by a mean between the reſult of the obſervations made at Canton, and that of the obſervations made in the Typa, by W. Bayly,

* *Ane. Mém. de l'Académie des Sciences.* Vol. VII. page 705.

† Firſt volume of his obſervations, 1682, 8vo. page 214.

‡ *The Original Aſtronomical Obſervations*, &c. page 76. "By a mean" ſays *Bayly*, "of a "number of obſervations of meridian altitudes of the ſun taken with my aſtronomical quadrant, and "*Hadley's* ſextant, the latitude of the *Typa* is 22° 9′ 22″ north, and that of *Macao* harbour by "the town 22° 12′ north. The *Typa* is 3 miles ſouth from the town, and it is one mile weſt "of it."

Captain

Captain KING, and ſeveral officers belonging to the RESOLUTION. I remark that this determination agrees with that in the *Connaiſſance des Temps*, obtained by a very different method: for in the Note communicated to me by Citizen MÉCHAIN, it is mentioned that the longitude inſerted in the *Connaiſſance des Temps* is determined from ancient obſervations of eclipſes of the moon, of the 30th of November 1686, and of the 21ſt of November 1695, obſerved at MACAO by the Jeſuits. But I am very far from pretending that this agreement, which is due only to chance, ſtrengthens the determination which I have adopted: every one knows what little reliance is to be placed on the reſults of the moon's eclipſes, ſtill leſs on obſervations which are dated a century ago.

ROBERTSON's longitude differs from mine by 5 minutes in defect; but, to obtain it, he employed only the obſervations made at CANTON with the difference of meridian of MACAO in regard to this former city; whereas I have thought that the longitude of MACAO ſhould be made to participate in the numerous obſervations which were made in the TYPA in COOK's third voyage.

The longitude which DAGELET has deduced from his obſervations made at MACAO is 111° 19′ 30″ eaſt from PARIS, that is, 4° 30′ more to the eaſtward than the determination on which I have fixed, and 9° 45′ more than that adopted by ROBERTSON.

2. PULO-CONDORE. In ROBERTSON's Memoir, page 8, it is ſeen that the latitude of this iſland is between 8° 38′ and 8° 40′; and he has fixed it at 8° 40′, in his *Table of Poſitions*. That which I have adopted is the ſame, and this is the latitude given by the obſervation of the ſun's meridian altitude, taken with ſextants, at PULO-CONDORE, by

W. BAYLY, and by Captain KING and other officers belonging to the RESOLUTION, on the 21ſt, 26th, and 27th of January 1780: the mean reſult would even be rather above than below 8° 41′*.

As for the longitude, I do not differ a quarter of a minute of a degree from that in the *Connaiſſance des Temps*, but 13 minutes 38 ſeconds from that which ROBERTSON has given in his *Table of Poſitions*.

He ſays (page 8 of his Memoir) that, by the chronometers in the RESO-
" LUTION, PULO-CONDORE lies in longitude 106° 18′ eaſt of GREENWICH, 1°
" 42′ eaſt of PULO-AOR; 2° 4′ eaſt of PULO-TIMOAN; and 2° 5′ weſt of
" PULO-SAPATA:" and he fixes on the longitude of 106° 18′ 00″ eaſt from GREENWICH.

It appears that ROBERTSON has adhered to the mean reſult of 49 ſets of lunar obſervations made at PULO-CONDORE by Captain KING and other officers belonging to the RESOLUTION, which is 106° 18′ 46″: but the mean reſult of the 22 obſervations by the aſtronomer BAYLY, is 106° 44′ 29″; and I have had the more reaſon to take the mean between the two mean reſults, as, if the one appeared to deſerve a preference to the other, it would be that of BAYLY, ſince the extremes of his 22 individual reſults differ between them only 0° 40′ 7″, while the extremes of the 49 particular reſults of the obſervations in the RESOLUTION differ 1° 23′ 15″*. I have therefore placed PULO-CONDORE, according to the mean of the reſults of all the obſervations made in the harbour of that iſland in COOK's voyage, in 106° 31′ 38″ eaſt from GREENWICH, or 104° 11′ 23″ eaſt from PARIS.

* See *The original aſtronomical obſervations*, &c. By W. Bayly, page 80.

† *The original aſtronomical obſervations*, &c. page 351.

In

In the ſheet No 51 of the ſupplement to the ſecond edition of D'APRÈS' *Neptune Oriental*, is a plan of PULO-CONDORE; and under the title, ſtands a note which may lead into error ſuch French navigators as are acquainted only with this *Neptune* for directing their route in the ſeas of ASIA: " *This* " *Iſland* (it is there ſaid) *is ſituated in* 8° 40′ *and* 45′ *north latitude, and* 103° 40′ *weſt longitude from the meridian of* PARIS: the firſt of theſe latitudes is the true one; but the longitude indicated is *too ſmall* by at leaſt *two-thirds of a degree.*

3. PULO-AOR. The latitude which I give to it is the ſame as that in the *Connaiſſance des Temps*; and each is the mean reſult of the obſervations made in COOK's third voyage.

That of ROBERTSON differs from it by upwards of *twelve minutes* in *defect*; and this difference is too great in a determination in *latitude*, for us not to have reaſon to be ſurpriſed at it, and to be apprehenſive of an error on the one ſide or the other.

ROBERTSON ſays in his Memoir (page 9), that the latitude of PULO-AOR is between 2° 29′ and 2° 30′ north; in his *Table of Poſitions* (page 77) we find alſo 2° 30′; and the iſland is laid down on his chart in 2° 30′: thus, there is no error of the preſs.

But W. BAYLY, in his *Table of Poſitions*, gives for the latitude of PULO-AOR, according to his own obſervations 2° 44′ 00″: and according to thoſe of KING, 2° 40′ 00″; mean 2° 42′ 00″: and Captain KING, in the narrative of the voyage ſays that, on the 31ſt of January 1780, " at nine o'clock in " the evening, the weather being thick and hazy, and the ſhips having " outrun their reckoning from the effect of ſome current, we were cloſe

" upon PULO-AOR, in latitude 2° 46′ 00″ north, before we were well aware " of it*:" thus, neither is there here an error of the preſs.

On which ſide lies the miſtake? I dare not pronounce. I remark, however, that ROBERTSON *merely* ſays that the latitude of PULO-AOR is between 2° 29′, and 2° 30′ north; but he neither quotes the obſervation nor the obſerver; and as he is tolerably exact, and with reaſon, in quoting both, when the determination is founded on an obſervation, it may be ſuppoſed that he knew of none that could fix the latitude of PULO-AOR †. Perhaps, for want of an obſervation, he has taken the latitude of this iſland from Mr. DALRYMPLE's *Chart of the China Sea*, where it is placed, as well as on the charts Nos. 47 and 49, 2nd of the ſupplement of the 2nd edition of D'APRÈS' *Neptune Oriental*, in the ſame latitude as that aſſigned to it by ROBERTSON.

We muſt requeſt the navigators who frequent this ſea to aſcertain, when ever they have an opportunity, which of the two poſitions is the true one.

4. PULO-SAPATA. My latitude, which will be found conformable to that given in the *Connaiſſance des Temps*, is the mean reſult of the obſervations made in COOK's third voyage: 10° 4′ 00″ by thoſe of KING ‡: and by thoſe of BAYLY §, 10° 5′ 0″. ROBERSON (page 6 of his Memoir) ſays " The latitude

* *Cook's third voyage.* Vol. III. pages 463 and 464.

† The publication of the narrative and of the original obſervations of *Cook*'s voyage is, however, prior by ſeveral years to the publication of *Robertſon*'s Memoir and Chart: Why does he not make uſe of theſe obſervations? Why does he not quote them? I am ignorant of the reaſon. Has he conſidered that they ought not to be admitted? In that caſe, he ought to have ſaid ſo, and expoſed his motives for rejecting them.

‡ *Cook's third voyage.* Vol. III. page 447.

§ *The Orig. Aſtron. Obſerv.* &c. page 351.

of

of PULO-SAPATA I make by *satisfactory* obſervations to be 10° 1′ 30″ north; but as he neither adds whether theſe obſervations were made by himſelf, nor by whom they were made, I have thought it my duty to adhere to thoſe the obſervers of which are known; and I have placed PULO-SAPATA in 10° 4′ 30″ north latitude. It is in 10° 00″ on DALRYMPLE's *Chart of the China Sea*, and on the copy which D'APRÈS has given of it.

In order to fix the longitude of this iſland, ROBERTSON has had regard only to its mean difference of meridian, 2° 55′ 00″ with reſpect to PULO-CONDORE, which he places according to the obſervations made in COOK's voyage, in 106° 18′ 00″ eaſt from GREENWICH, or 103° 57′ 45″ eaſt from PARIS, which would give 108° 53′ 00″ eaſt from GREENWICH for PULO-SAPATA: however, in his *Table of Poſitions* he carries it to 108° 55′ 00″, or 106° 34′ 45″ eaſt from PARIS. He adds (page 7 of his Memoir) that "there "is little doubt of its true longitude being ſomewhere within 108° 53′ and "109° eaſt from GREENWICH.

In placing PULO-SAPATA 106° 40′ 45″ eaſt from PARIS or 109° 1′ 00″ eaſt from GREENWICH, I do not recede from the opinion of ROBERTSON; but I obtain this reſult by making the longitude of SAPATA depend on the longitudes obſerved of MACAO, PULO-CONDORE, and PULO-AOR, and taking a mean between the three determinations which reſult from the differences of meridian obſerved between PULO-SAPATA and each of the three other points (page 333 of this Vol. Note †.)

NOTE LXI.

On examining the diſtance and the bearing of the iſlots called THE TWO BROTHERS with reſpect to PULO-SAPATA, on the *Chart of the China Sea* by

by ALEXANDER DALRYMPLE, and on the *General Chart of the World*, conſtructed by Lieutenant ROBERTS to accompany the narrative of COOK's third voyage, we find a ſomewhat conſiderable difference reſpecting the relative poſition which the two charts have given to the iſlots and the iſland.

On DALRYMPLE's chart, THE TWO BROTHERS are ſituated at the diſtance of 33 miles, to the north 17° *weſt* of the largeſt of the PULO-SAPATA: and according to ROBERTS's chart, that would be to the north about 40° *eaſt*, and at a greater diſtance than according to the former, by 10 or 15 miles, as far as the ſmallneſs of the diviſions of the ſcale admit of its being eſtimated.

The bearings which were taken on board the SOLIDE in ſight of the iſlots and in ſight of the iſland, the courſe which ſhe followed in order to repair from one point of bearing to the other, and the number of leagues which ſhe ran on this courſe, furniſh us with the data neceſſary for determining, by approximation, the relative poſition of THE TWO BROTHERS and PULO-SAPATA.

On the 11th at forty minutes paſt four o'clock in the afternoon, THE TWO BROTHERS bore weſt by ſouth, at the diſtance of about 5 leagues or 15 miles: thus, comparatively to the point where the bearings were taken they were 2.9 miles more to the ſouthward, and 14.7 miles more to the weſtward than the ſhip.

At three quarters paſt midnight, the largeſt of the PULO-SAPATA bore directly weſt, diſtant 5 miles.

On reducing into a ſingle courſe all thoſe which the SOLIDE ran in the interval from one bearing to another *, we find that ſhe made 18.5 miles ſouthing and 3.25 miles eaſting.

But I remark that, on comparing the latitude obſerved on the 11th at noon (JOURNAL OF THE ROUTE) 11° 14′, with that of PULO-SAPATA (on the parallel of which the ſhip was at the moment of the bearing being taken at three quarters paſt midnight), that is to ſay, with 10° 4′ 30″ †, it is ſeen that, from noon to three quarters paſt midnight, the ſhip's real progreſs towards the ſouth had been 1° 9′ 30″, or 69.5 miles: and, as according to the dead reckoning, the apparent progreſs towards the ſame ſide, and in the ſame interval of time, had been only 41.5 miles ‡; it follows that the dead reckoning had been in error 28 miles, in the ſpace of 12¾ hours; and proportionably, in the ſpace of 8 hours and 5 minutes, elapſed between the time of taking the firſt bearing and that of taking the ſecond, the error muſt have been 17.74 miles: adding this latter quantity to 18.5 miles apparent progreſs towards the ſouth, we ſhall have the real or corrected progreſs, in the interval from one bearing to the other, 36.24 miles.

hours.	miles.	hours.	miles.
* From 4½ to 5 SW. 4° S.	2.0	From 8 to 9 SSE	1.5
From 5 to 6 SW by S.	6.5	From 9 to 11 SE.	6.0
From 6 to 7 SSE ½ E.	1.25	From 11 to 12 SE by S.	3.0
From 7 to 8 SE by S	1.5	From 12 to 12¾ SSE	1.1

† According to the obſervations made in *Cook's* third voyage (page 351 of the collection) the latitude of *Pulo-Sapata* is, according to *King* 10° 4′; according to *Bayly* 10° 5′; by a mean 10° 4½′.

‡ From noon to 40 minutes paſt four o'clock on the 11th the courſes had been SW 28 miles and SW. 4° S. 4 miles, which gives 23 miles ſouthing, and as the progreſs towards this ſame ſide from 40 minutes paſt 4 to three quarters paſt midnight had been 18.5 miles, that the whole of the progreſs from noon to three quarters paſt midnight, was 41.5 miles.

The

The parallel of the point whence the ſecond bearing was taken, which is the parallel of PULO-SAPATA, is therefore leſs northerly than the parallel of the point whence the firſt was taken, by 36.24 miles; but THE TWO BROTHERS were leſs northerly than the point of the firſt bearing by 2.9 miles: they are therefore more northerly than PULO-SAPATA, by 36.24 miles *minus* 2.9 miles, or 33 34 miles.

Admitting the progreſs towards the eaſt, in the interval of the two bearings, from 40 minutes paſt four o'clock to three quarters paſt twelve, ſuch as it is given by the run by account, the point of the former is more weſterly than that of the latter by 3.25 miles: and as PULO-SAPATA is more weſterly than that of the latter, by 5 miles, it is more weſterly than that of the former, by 1.75 miles. But THE TWO BROTHERS are more weſterly than the point of the former bearing by 14.7 miles: therefore they are more weſterly than PULO-SAPATA, by 13 miles in round numbers.

On the other hand, we have ſeen that the TWO BROTHERS are more northerly than PULO-SAPATA, by 33.34 miles: on combining this quantity which they are more to the weſtward with that which they are more to the northward than the iſland, it will be found that THE TWO BROTHERS are with reſpect to the great PULO-SAPATA, north 21° 20′ weſt, and at the diſtance of 35 miles.

This relative poſition differs from that given them by DALRYMPLE's chart, which places the iſlots to the *north* 17° *weſt* of the iſland, and at the diſtance of 33 miles.

Although by the method which I have employed for aſcertaining this poſition, there can be obtained only a reſult of *approximation*, that reſult, however,

however, is ſufficiently exact for concluding with certainty, that theſe two points are better placed, with regard to each other, on DALRYMPLE's chart than on that conſtructed by ROBERTS for COOK's voyages, ſince on the latter, we ſee THE TWO BROTHERS ſituated at the diſtance of 40 or 50 miles, to the *north* 40° *eaſt* of the great PULO-SAPATA.

N. B. The remarks which Captain MARCHAND and Captain CHANAL had an opportunity of making on the ſtrength and direction of the currents in the CHINA SEA, till they quitted that Sea by the Strait BETWEEN BANCA and BILLITON and that of SUNDA, are to be found in the *NARRATIVE* itſelf, under the dates of the 15th, 18th, 19th, and 25th of December.

NOTE XLII.

ANALYSIS of the general Chart of the two Straits ſituated between the Iſland of BANCA and that of BILLITON, known by the name of GASPAR'S STRAIT and CLEMENTS' STRAIT, with ſailing directions relative to the two paſſages.

(*See* the general chart *Plate VII,* and the particular Chart *Plate VIII).*

The eaſt coaſt of the Iſland of BANCA and the weſt coaſt of the Iſland of BILLITON leave between them a large paſſage which was at firſt known only by the name of GASPAR'S STRAIT, becauſe D'APRÈS DE MANNEVILLETTE publiſhed, in 1775, the firſt Plan of this Strait (No. 48 of the ſecond edition of his *Neptune Oriental),* under the title of " *Petit Plan* DU DÉTROIT " A L'EST DE BANCA, *par lequel a paſſé un navire Eſpagnol commandé par le* " *Sieur GASPAR,*" no date*. But, in 1781, Captain JOHN CLEMENTS, com-

Alexander Dalrymple has given a copy of it in his collection of Plans of the *Seas of Aſia.*

 manding

manding a fleet of Engliſh Eaſt-Indiamen, croſſed between BANCA and BILLITON by another paſſage than that through which GASPAR had paſſed; and, ſince, ſeveral Engliſh and French navigators have paſſed through both, and given us particular charts of them. This ſtrait has long been frequented by the Portugueſe; but it is well known that the navigators of that nation publiſh nothing.

The great Strait BETWEEN BANCA AND BILLITON, whoſe width is about fourteen leagues from the one iſland to the other, is divided into two arms by a ſmall iſland which the Engliſh have named MIDDLE Iſland, and which is alſo called PASSAGE Iſland.

This Strait therefore affords two Paſſages: the former, or the WEST PASSAGE, between BANCA and MIDDLE Iſland; the latter, or the EAST PASSAGE, between MIDDLE Iſland and BILLITON.

We have five charts of the WEST PASSAGE: the firſt is that of Captain GASPAR, which alſo comprehends the EAST PASSAGE: but the latter is there repreſented in a manner which muſt induce the belief that it is impracticable.

The ſecond is a manuſcript chart of DORDELIN, an officer belonging to the French navy, commanding the ſhips TRITON, PROVENCE, and SAGITTAIRE, who paſſed through the WEST PASSAGE, in going to CHINA, in 1784, and on his return in 1785: he has annexed to it views of the land and a few remarks.

The third is that of Captain LESTOCK WILSON, an Engliſhman commanding the ſhip CARNATIC, coming from CHINA in 1787: Mr. DALRYMPLE has

has publiſhed it in his collection of Plans, and has printed the journal and obſervations of Captain WILSON, in his collection of *Memoirs*, &c. This chart deſerves particular attention, becauſe the intelligent and enlightened navigator by whom it was conſtructed, has there drawn all the angles of bearing inſerted in his journal, to which the chart is faithfully ſubjected; and the different points are connected with each other by trigonometrical operations: we remark above all that frequently, from the ſame ſtation, two points are ſet by each other or by oppoſite rhumbs: as, for inſtance, one point by another, north by eaſt; or elſe, a point north by eaſt, at the ſame time that he ſet another ſouth by weſt: and it is well known that bearings of this ſort are the only ones which, for fixing relative poſitions, preſent an inconteſtable exactneſs.

The fourth chart is that of Captain JOHN PASCAL LARKINS, commanding the ſhip WARREN HASTINGS, coming from CHINA in 1788; it was publiſhed in the collection of Mr. DALRYMPLE's plans, and the Journal, in his collection of *Memoirs*. I wiſh it were in my power to beſtow the ſame praiſe on this chart as on that of Captain WILSON; but it is ſeldom found to agree with the Journal, according to which it ought to have been conſtructed; and the lands on it ſeem ſcattered and repreſented at random: fortunately, his journal furniſhes data which may be employed very uſefully in the plan of GASPAR's Strait.

The fifth, in ſhort, is the chart which was conſtructed in 1791, by Captain CHANAL, and the Engineer LE BRUN, on board the ſhip SOLIDE, commanded by Captain MARCHAND, coming from CHINA, and the data of which are to be found in the *NARRATIVE OF THE VOYAGE* vol. I. at the date of the 21ſt, 22nd, and 23rd of December, 1791.

We have but three plans of the EAST PASSAGE; and they can be reckoned only as two.

The firſt is that of Captain JOHN CLEMENTS, commanding a fleet of Indiamen: he is, as I have already ſaid, the firſt known navigator who attempted in 1781 to paſs through the EAST PASSAGE, and ſtruck out this new track to the ſhips of his nation. The name of CLEMENTS' Strait diſtinguiſhes it from the WEST PASSAGE or GASPAR'S STRAIT. The plan of this Strait was conſtructed by GEORGE ROBERTSON, an officer employed on board the Commodore's ſhip, the VANSITTART*; Mr. Dalrymple was the firſt who publiſhed it, in his *Collection* in 1786: and, in 1788, ROBERTSON brought out a *Plan of Gaſpar's and Clements' Straits* together, without any ſcale of latitude, like that of 1786, but with a ſcale of marine miles of $2\frac{1}{4}$ lines to a mile. In the ſame year, he publiſhed a chart of the *Straits of Banca, Gaſpar, and Clements*, united in the ſame ſheet on a ſcale of ſix inches to a degree. On both are drawn the tracks of the different Engliſh navigators who have paſſed through theſe Straits.

From this expoſition of ROBERTSON's labour, which appears to have been performed with equal care and intelligence, it ſeems that it might have been ſufficient to copy his chart or his plan, and to add to it the track of the French navigators; but I hope that the ſeamen who ſhall read the analyſis of the new chart which I preſent to them, will be of opinion that ROBERTSON's chart and plan ſtood in need of ſome corrections; and, no doubt, a longer acquaintance with theſe ſtraits will ſoon prove that this new chart itſelf is ſuſceptible of improvement. I will not diſſemble, that it ſtill leaves much to

* This is a miſtake: though ROBERTSON was on board the *Vanſittart*, the Commodore's ſhip was the *Glatton*. *Tranſlator.*

be

be wiſhed for: what! does not every one know that a ſea chart is never finiſhed?

The ſecond plan of the East Passage is a chart of Captain Allen Cooper, commanding the ſhip Atlas, in 1785, and coming from the ſouthward. This chart is compriſed in the *Collection* of Mr. Dalrymple who has alſo publiſhed, in his collection of *Memoirs*, Captain Cooper's Journal; all the points there correſpond very exactly with the bearings inſerted in the journal.

Of theſe ſix charts or plans (for that of Gaspar is too defective in every part for it to be made any uſe of), I have formed a general chart which comprehends the two Passages, and preſents the whole of the great Strait Between Banca and Billiton: the plans of the West Passage are connected to thoſe of the East Passage by Gaspar's and Middle Iſlands which are common to the two paſſages, and from which bearings have been taken on the two routes. But in order to enable enlightened navigators to judge of this new chart, I muſt diſcuſs the materials of which I have made uſe, and examine, point by point, and contradictorily, the journals and charts, which, till this day, have come to my knowledge.

I begin by the analyſis of the West Passage; and, in going from the northward to the ſouthward, it will lead us to the points which are common to the two paſſages.

I. The northern coaſt of Banca, from Point Pesant to its East Point, was drawn from the journal and chart of Captain Chanal, who took bearings of the different points.

The four BREAKERS ſituated to the north-eaſt of Point BRISÉE of BANCA and marked on my chart a, b, c, d, as well as the iſles and iſlots to the eaſtward of that point, were in like manner ſubjected to bearings taken on board the SOLIDE* which, as is ſeen by her track drawn on the chart and mentioned in the narrative, paſſed between the four BREAKERS to the north of

* On the 21ſt of December 1791, at three quarters paſt 4, P. M. Point *Briſée*, bore S. 30° W. the firſt iſland on the coaſt, to the eaſtward of this point, S. from 17 to 20′ W: the ſecond iſland S. from 10 to 12° W.

Captain MARCHAND hauled cloſe on a wind on the larboard tack, with a freſh breeze at N. N. W. in order to avoid a breaker which was perceived to the ſouthward.

At 4 minutes after 5, this breaker bore S. 18° W. 2 or 3 miles.

At 12 minutes after 5, a ſecond breaker ſhewed itſelf to the north 15° eaſt diſtant 1½ or 2 miles.

At the ſame inſtant, a third was ſeen to the ſouth 3° 30′ weſt, at the diſtance of 3 or 4 miles.

The SOLIDE bore up to the ſouth-eaſt in order to clear a fourth breaker which was ſeen ahead.

At 50 minutes after 5, the firſt iſland that had been ſet, bore from ſouth 43° to ſouth 49° weſt; the ſecond, from ſouth 38 to 40° weſt.

At 2 minutes after ſix, the fourth breaker which had been ſeen, bore ſouth 67° eaſt, diſtant 4 or 5 miles.

From three quarters paſt four, the ſoundings had been 12, 13, and 14 fathoms, over a bottom of ſand, gravel, and broken ſhells: the ſame bottom continued till ¼ paſt 6, when Captain *Marchand* came to an anchor, in 14 fathoms, with the ſame kind of bottom.

During the night, there was a moderate breeze from the north-weſt with clear weather: the currents ſet faintly to the ſouth-ſouth-eaſt and eaſt-ſouth-eaſt.

On the 22nd at break of day, the following bearings were taken: Point *Briſée* S. ½ W. the third iſland, from ſouth 35° 30′ to ſouth 38° weſt—the fourth iſland, from ſouth 2 to ſouth 4° 30′ weſt.

Captain *Marchand* got under way at 50 minutes paſt 7, and ſteered S. S. E. ½ E: ſtill carrying 14 fathoms, over a bottom of ſand, gravel, and broken ſhells.

At 50 minutes after 8, Point *Briſée* weſt 1° 30′ ſouth—the third iſland, from ſouth 56° to ſouth 67° 30′ weſt—The fourth iſland, from ſouth 34° 30′ to ſouth 35° 30′ weſt—at 40 minutes paſt 9, the third iſland from ſouth 83° to ſouth 84° weſt; and the fourth or laſt iſland, from ſouth 67° to ſouth 70° weſt. This laſt appears to be ſurrounded by breakers.

From that moment, Captain *Marchand* ſtood ſouth eaſt by ſouth—ſoundings from 14 to 13 fathoms, conſtantly the ſame kind of bottom, till 4 minutes after 11, when having perceived from the maſthead *Gaſpar* Iſland to the eaſt 6° ſouth, he ſteered S. E. by E.

At a quarter paſt 11, the high mountain of *Banca* bore from S. 13° to S. 42° W.: ſtill 14 fathoms, *with the ſame kind of bottom.*

BANCA,

BANCA, in the midſt of which ſhe anchored. The MASCARIN, commanded by our Captain CROZET, in 1773, had paſſed and anchored there like the SOLIDE*; and it appears that, as far back as 1702, the Engliſh galley the MACCLESFIELD had taken her route through theſe BREAKERS†. These two are the ſame that Captain WILLIAMS in the SULIVAN ſaw and took bearings of in December 1784; but it appears, from what is ſaid in his journal, that he ſaw three only; and, on ſetting off theſe bearings on my chart, we conceive that the BREAKERS which he ſaw are the three weſterly ones, and that he did not perceive the fourth, ſituated to the eaſtward of theſe. The Journal of the SULIVAN makes no mention of the ſmall iſlands: it is only ſaid there that, at noon of the day on which, in the afternoon, the BREAKERS were diſcovered, there was ſeen, from the maſt-head, an iſland to the ſouth-ſouth-weſt; but the weather was ſo over-caſt, that BANCA could not be ſeen‡.

* *See* her track drawn on the chart No. 49 2nd of the ſecond edition of *D'Après Neptune Oriental:* a copy of it is to be found in *Alexander Dalrymple's* collection of Plans.

Mr. *Dalrymple* has publiſhed, under the date of the 17th of December 1781, a *View* of *Banca*, of the iſlots and the breakers, taken from the point where *Crozet* had anchored. This plan, which is inſerted in his *Collection*, is to be found there under the title of *Plan of the Place where Monſieur* Crozet *anchored* (latitude 1° 56 ſouth) *on the eaſt ſide of* Banca, on the 23rd of March 1773.

† Farther on will be found an extract from his journal, taken from the collection of *Memoirs*, publiſhed by *Alexander Dalrymple.*

‡ Extract from the journal of the Sulivan, Captain *Stephen Williams*, coming from *China*, taken from the *Collection* of *memoirs* publiſhed by *Alexander Dalrymple*, *Appendix to memoirs of Charts of Sunda and Banca*, pages 15 and 16.

" On the 25th of December 1784, At 6 A. M. the weather clearing a little, ſaw the iſland of *Banca* S. W. by W.

" At 8 A. M. ſaw a high body of land from S. by W. to W. by N. which is the land we firſt " ſaw; diſtant from the neareſt ſhore about 5 leagues."

" At noon ſaw an iſland from the maſt-head S. S. W. being very cloudy could not ſee *Banca.*"

" At half paſt 2 P. M. ſaw three *ſhoals* of *Breakers*, one bearing about S. S. W. 3 miles " diſtant—another S. E. by S. 3 miles, and another E. N. E. about 4 miles."

" I immediately hauled my wind to the northward. (Wind N. W. courſe N. N. E.)

" At half paſt 4 P. M. the northernmoſt *breakers* bore S. E. by E. ½ E. diſtant full two miles; " on the *breakers* there appeared *two* or *three* rocks above water."

In

In following on D'APRÈS' Chart (No. 49 2nd) the Track of the MASCARIN which came from the eaſtward, it is ſeen that CROZET had firſt perceived the BREAKERS which are ſituated to the north by weſt of GASPAR Iſland (the principal leading mark in the Strait); and that before he had reached the four BREAKERS to the northward of BANCA, he had ſeen in the interval a *ſolitary* BREAKER which is laid down on D'APRÈS' chart, and which I have thought neceſſary to preſerve on mine, becauſe, if its poſition be doubtful, its exiſtence is certain. The SOLIDE's track paſſes three leagues to the eaſtward of this ſolitary BREAKER: it was not ſeen by Captain MARCHAND; but a BREAKER which, perhaps, does not always break, may probably not be perceived at three leagues' diſtance.

II. Let us endeavour to fix the latitude of GASPAR Iſland, the principal leading mark for ſhips that are bound through the ſtraits from the northward.

On the old Plan publiſhed by D'APRÈS, No. 48 of the ſecond edition of his *Neptune Oriental*, GASPAR Iſland, under the name of *Ile du* PASSAGE (PASSAGE Iſland), is placed in 2° 6′ ſouth latitude. This latitude is certainly ſmaller than the true, by upwards of a quarter of a degree: but how had it been obſerved? by whom? and with what inſtrument?

On D'APRÈS' CHART No 49 2nd, a copy of which is to be found in Mr. DALRYMPLE's Collection, and on which is marked a track of CROZET, in 1773, which paſſes to the northward of the ſtraits and pretty near GASPAR Iſland, the latitude of the middle of this iſland is 2° 17′; but we are ignorant by what proceeding it was determined.

ROBERTSON's

ROBERTSON's Plan, inſerted in Mr. DALRYMPLE's collection, under the date of 1786, has no ſcale of latitude: in that which ROBERTSON himſelf publiſhed in 1788, and which differs from the former only by its being on a larger ſcale, and alſo comprehending GASPAR's STRAIT, we read in the parallel which paſſes through the peak of GASPAR's Iſland, *Latitude South* 2° 20′; but it is not mentioned that this latitude was obſerved; we are even juſtified in thinking that it was not; for we remark that the ſmalleſt diſtance at which CLEMENTS was from the iſland, is 26 *miles* to the ſouth-eaſt: and if, in this poſition, he had deduced the latitude of GASPAR Iſland from ſo diſadvantageous a bearing, eſpecially when it is combined with ſo great a diſtance, this determination could not but be very doubtful. Indeed, it does not appear that ROBERTSON has adopted it excluſively: for in his Table of Latitudes and Longitudes which is to be found at the end of the Memoir that he publiſhed with his handſome Chart of the CHINA SEA*; the Peak of GASPAR Iſland is placed in latitude 2° 27′, though, on his Plan of the Strait, it is laid down in 2° 30′, and though, in his chart of the *Straits of Banca, Gaſpar and Clements*, it is alſo 2° 30′: and, in the ſame Table, he gives a ſecond latitude of the ſame point of GASPAR Iſland, of 2° 25′ 35″: this laſt is accompanied by the mark †, which indicates the poſitions deduced from the obſervations of Captains HUDDART, HOGDSON, and WILSON, "which," he ſays, "are ſeemingly well determined."

DORDELIN, in a manuſcript Memoir, relates that, on the 3rd of Auguſt 1784, GASPAR Iſland bore from him at noon, from north-eaſt by north 3° 45′ north to north-north-eaſt, diſtant 5 leagues: which places the ſouth coaſt of the iſland in 2° 22′, and its peak in 2° 21′ 15″.

* *Memoir of a Chart of the China Sea, &c. by George Robertſon, London*, 1791, 4to, page 123.

On the 23rd of February 1785, on his return from CHINA, the obſerved latitude of the ſhip was 2° 24′, and GASPAR Iſland bore at the ſame moment, from eaſt 15° ſouth to eaſt 26° ſouth, at the diſtance of 3 or 4 miles at moſt: which gives 2° 24′ 30″ for the north coaſt of the iſland, and 2° 25′ 15″ for the Peak.

On the ſame day the captain of the ſhip the PROVENCE (a man of great reputation, ſays DORDELIN), which was ſailing in company with the TRITON, had an obſerved latitude of 2° 22′, which would give for the Peak of the iſland 2° 23′ 15″.

Captain COOPER, in 1785, ſays, in his printed Journal, page 24, that, on the 8th of Auguſt, he took his departure from GASPAR Iſland, as it bore at noon of that day, north 19° eaſt diſtant 4 or 5 miles. The latitude of the ſhip, obſerved at noon, was 2° 33′, whence we conclude that the latitude of the iſland, according to the bearing, is 2° 28′ 45″: but the obſervation is marked *indifferent*, that is neither good nor bad, doubtful; and we muſt imagine that COOPER did not conſider himſelf bound to adhere to it; for, after having ſaid in his Journal, that he places GASPAR Iſland in latitude 2° 30′ ſouth, we find it placed on his chart, in 2° 21′ 20″, at its middle.

Captain WILSON, in 1787, deduced from his obſervations and from his bearings in the Strait the latitude of GASPAR Iſland 2° 22′ 00″ (page 28 of his printed Journal) but it is not mentioned to what point of the iſland he applies it: on his chart, the north coaſt of the iſland is in 2° 19′, the Peak, in 2° 20′, and the ſouth coaſt, in 2° 21′.

Captain LARKINS, in 1788, having got aground on the *Shoal* which he diſcovered to the north-weſt of GASPAR Iſland, there obſerved the latitude (page 16 and 17 of his Journal): on the 2nd of May 2° 22′; on the 3rd, 2° 23′;

23 ; on the 4th, 2° 22′; by a mean, 2° 22′ 20″, and the point where he ſtruck is laid down on his chart of the Strait in 2° 23′.

But he ſays (page 16,) that from this very point, the centre of GASPAR Iſland bore ſouth 70° eaſt, diſtant 6 miles: this iſland would therefore be according to the bearing $5\frac{2}{3}$ more to the ſouthward than the point where he ſtruck, and conſequently in 2° 28′ 40″; but, on his chart, it is placed in 2° 25′ 45″. I am ignorant of the cauſe of this difference; but it will be ſeen hereafter that there muſt be an error in the diſtances eſtimated by the eye; for it is impoſſible to make theſe diſtances agree with the angles of bearing taken, from the place where the ſhip got aground, to the middle of GASPAR Iſland and to the middle of ROCHER NAVIRE, the TREE ISLAND of the Engliſh.

On the 22nd of December 1791, Captains MARCHAND and CHANAL deduced from their obſervations at noon the latitude of the SOLIDE, 2° 21′, and as the Peak of GASPAR Iſland bore, at the ſame inſtant, directly eaſt of the ſhip, its latitude is the ſame as that of the SOLIDE*.

On recapitulating all the latitudes of GASPAR Iſland which I have mentioned:

		°	′	″
GASPAR's Plan		2	5	00
CROZET's Track		2	17	00
ROBERTSON's	Memoir	2	27	00
		2	25	35
	Plan and Chart	2	30	00
DORDELIN, 1784		2	21	15
DORDELIN, 1785		2	25	15
The ſhip the PROVENCE,		2	23	15

		°	′	″
COOPER	Journal	2	30	00
	On his chart	2	21	20
WILSON	Journal	2	22	00
	On his chart	2	20	00
LARKINS	Journal	2	28	40
	On his chart	2	25	45
MARCHAND and CHANAL	Journal & chart	2	21	00

* *See* the *Journal of the Route* at the date of the 22nd of Dec. 1791.

it is ſeen that, with a great number of determinations, the latitude of GASPAR Iſland cannot be determined in an inconteſtible manner. Navigators, no doubt, will not be willing to admit the firſt two, the foundations of which are unknown, and which beſides differ too much from thoſe that have been ſubſequently obſerved; thoſe of DORDELIN and of the ſhip the PROVENCE depend on eſtimated diſtances: thoſe of the Engliſh preſent, in general, one quantity in their Journals, and another quantity on their charts; the latitude determined by Captains MARCHAND and CHANAL is the only one againſt which no objection can be made; the ſhip was exactly on the parallel of the Peak of GASPAR Iſland, at the moment when a good obſervation gave 2° 21′ for the latitude; I remark, beſides, that this determination is the ſame as that of DORDELIN in 1784; the ſame as that which COOPER has employed on his chart; the ſame, within a minute, as that given by Captain WILSON whoſe obſervations are reputed correct. I add another remark to the firſt. Navigators know that it is very difficult to determine with exactneſs the latitudes of points ſituated near the equator, eſpecially in the months when the ſun has little declination, becauſe the meridian altitude of the ſun cannot be obſerved with preciſion, when the luminary culminates near the zenith of the obſerver*: now the obſervation of Captains MARCHAND and CHANAL was made on the 22nd of December, a day of the ſummer ſolſtice in the auſtral hemiſphere, that is, at one of the periods of the year the moſt favourable for having, at noon, the ſun leſs near the zenith, when the obſerver is in the parallels in the vicinity of the equator; whereas COOPER having obſerved on the 8th of Auguſt; DORDELIN, on the 3rd of Auguſt and 23rd of February; LARKINS, on the 2nd of May and following days; thoſe navi-

* It is to this difficulty of obſerving exactly the meridian altitudes of the ſun near the zenith, that muſt be attributed the great differences that are remarked between the latitudes which different ſeamen, good obſervers, have given to the ſame points of the weſt coaſt of *Africa* ſituated in the vicinity of the equinoctial line.

gators muſt have had the ſun much nearer the zenith than the obſervers of the SOLIDE had, I am therefore of opinion that, without fearing to be ſuſpected of too favourable a prepoſſeſſion for the obſervation of theſe laſt, I can grant it the preference to the others, and place the Peak of GASPAR Iſland in latitude 2° 21′ ſouth.

As for its longitude, it may be determined by approximation,

In G. ROBERTSON's Table, we find two poſitions which differ little from each other: the firſt, marked *, 107° 4′ eaſt from Greenwich, or 104° 43′ 45″ eaſt from PARIS, is that which Robertſon has diſcuſſed and which he has employed in his chart of the CHINA SEA *: the ſecond, marked †; 107° 7′ 15″ eaſt from GREENWICH, or 104° 7′ eaſt from PARIS, is that which WILSON's obſervations have given; but it will be 104° 48′ 45″ if we place PULO-AOR, from which he deduced its longitude by a chronometer, in 102° 19′ 45″ weſt from PARIS †.

Captain COOPER (page 24 of his Journal) ſays that he has placed GASPAR Iſland, by his chronometer *corrected*, in longitude 106° 55′ eaſt from GREENWICH, or 104° 34′ 45″ eaſt from PARIS. But Mr. DALRYMPLE, who in his collection of *Memoirs*, has printed COOPER's original Journal, obſerves, in an introduction which he has prefixed to this Journal (page iv) that at

* Mr. *Robertſon* has varied reſpecting the longitude of *Gaſpar* iſland: for it has juſt been ſeen that, in his *Table* of *Poſitions*, publiſhed in 1790, he gives this longitude 107° 4′ eaſt from *Greenwich*, and this is within 2 minutes, that of his *Chart of the China Sea*, publiſhed the ſame year on which *Gaſpar* is placed in 107° 2′; but on his chart of *the Straits of Banca, Gaſpar, and Clements*, 1788, and on his large *Plan of Gaſpar s and Clements' Straits*, the ſame year, it was 106° 53′, and 106° 54′.

† *See* Note LX. pages 331 and 335 are the longitude which *Robertſon* has given to *Pulo-Aor* and that which I have deduced: *Wilſon's* chronometer gave him for *Gaſpar* 2° 29′ eaſt from *Aor*. (See his Journal page 28.)

the

the time when this navigator paſſed the Strait, his chronometer did not give the longitude with *competent preciſion.*

Captain CHANAL, in comparing his dead reckoning, corrected by allowing for the effect of the currents, to the longitude of the NORTH point of BANCA, ſuch as it is given on D'APRÈS' chart, reckoned that the longitude of the ſhip, on the 22nd at noon, was 104° 12′ eaſt from PARIS: and, as at this period, the diſtance from the Peak of GASPAR Iſland, eſtimated by the eye, was 28 or 29 miles eaſt, he makes the longitude of the Peak 104° 40′ or 41.

In taking a mean between the determinations which I have juſt mentioned; but excluding the third, which differs too much from the other three, and granting ſomething more to that of WILSON than to the firſt two, we might place the Peak of GASPAR Iſland in longitude 104° 45′ 00″ weſt from PARIS, or 107° 5′ 15″ weſt from GREENWICH.

III. After GASPAR iſland, which as I have ſaid, is properly the leading mark for the entrance of the ſtrait, in coming from the northward, the point that it is of moſt importance to fix, is the dangerous ſhoal which Captain LARKINS diſcovered in 1788, on which his ſhip remained aground for three days, and which may be called the WARREN HASTINGS' Shoal, from the name of his ſhip: unfortunately, the contradiction that is to be found between his journal and his chart leaves a great uncertainty reſpecting the real poſition of this ſhoal in regard to GASPAR Iſland and TREE Iſland; but at leaſt navigators will be appriſed that they have to avoid a ſhoal ſituated to the weſt-north-weſt of the iſland. I ſhall compare the bearings and diſtances, ſuch as they appear in the Journal taken from the point where the ſhip ſtruck on the eaſt edge of the ſhoal, with the bearings and diſtances of the ſame points ſuch as they ſtand on the chart.

In the Journal (page 16.)	*On the Chart.*
The high land of BANCA, S. 58° W.	Is not on the chart.
The extremes of BANCA, from S. 22° W. to S. 62° W.	The eaſt point of BANCA S. 35° W. The lands more to the weſtward are not delineated on it.
The centre of GASPAR iſland S. 70° E. diſtant 6 miles.	S. 60° E. 6 miles.
TREE Iſland; or ROCHER-NAVIRE S. 17° E. diſtant 9 miles.	Directly ſouth of the ſhoal, $5\frac{1}{2}$ miles.

The compariſon of the poſitions given in LARKINS's Journal and of thoſe which he has employed in his Chart, is ſufficient, without any obſervation, to ſhew the want of agreement.

Let us firſt endeavour to place TREE Iſland (ROCHER NAVIRE) in the poſition which it ought to have with reſpect to GASPAR Iſland; we ſhall afterwards ſee how it will be poſſible to ſubject the WARREN HASTINGS' Shoal to theſe two points, by the bearings which LARKINS took of them, while he lay aground.

WILSON, page 4 of his Journal, ſays that, paſſing to the weſtward of TREE Iſland, GASPAR *Iſland* bore in one with it, north 62° eaſt, or eaſt 28° north; but this linear direction, on his chart, is that of the centres of the two objects; and the moſt ſouthern part of the iſland there lies, with reſpect to the moſt ſouthern part of TREE Iſland, eaſt $22\frac{1}{2}$ or 23° north. The bearing of theſe laſt two points is exactly the ſame on DORDELIN's manuſcript chart, on ROBERTSON's large plan, and on LARKINS's chart: and the SOLIDE, in paſſing to the weſtward of TREE Iſland, at the diſtance of about five miles, had the ſouth point of GASPAR in one with the ſouth iſlot of TREE

Iſland,

Iſland, bearing eaſt 23° north*. On ROBERTSON's large Plan, the centres of the two objects, as well as their moſt ſouthern points lie in like manner, with reſpect to each other eaſt-north-eaſt and weſt-ſouth-weſt. This bearing of the centre of TREE Iſland, to the ſouth 62° weſt, or weſt, 28° ſouth, from the centre of GASPAR Iſland, therefore, appears aſcertained in ſuch a manner that it may be employed with ſafety; and it is, no doubt vaguely, that Captain COOPER ſays, in his Journal, that TREE Iſland is to the ſouth-weſt of GASPAR Iſland; for, on his chart, he has placed the ſouth iſlot to the weſt 22 or 23° ſouth of GASPAR.

As to the diſtance of TREE Iſland from GASPAR Iſland, the Plan of DORDELIN† who paſſed between them both, in going to and coming from CHINA, and anchored there, gives us the width of the channel, from coaſt to coaſt, $5\frac{1}{2}$ miles, and it is the ſame on ROBERTSON's large plan, and there are ſeen four tracks of ſhips, marked between GASPAR Iſland and TREE Iſland.

Captain WILSON, (page 28 of his *Journal*) has concluded from his different bearings, taken from a baſe which he meaſured by the ſhip's way, that this width was 6.64 miles; but he does not ſay whether it be from *coaſt to coaſt*, or from *centre to centre*; on the chart, this diſtance of 6.64 miles, is that from coaſt to coaſt; and that from centre to centre is there about $7\frac{1}{2}$ miles. The method which he employed for meaſuring the width of the channel is not ſuſceptible of very great preciſion: but, in combining ſome other bearings which he took in the ſtrait, and particularly thoſe from his ſtation *A*, we find that the diſtance from TREE Iſland to GASPAR Iſland, taken from centre to centre, may be reduced to 7.2 miles in lieu of 7.5. I obſerve, beſides, that there is never any inconvenience in preſenting on a chart a

* *See* the Narrative, vol. II. at the date of the 22nd of December, 1791.

† The ſcale of this Plan is 7 inches 7 lines to a degree.

channel

channel a little narrower than it really is, and that there is a great deal in presenting it too wide.

In ſaying that there is no danger in diminiſhing a little the width of the channel between GASPAR Iſland and TREE Iſland, I ſhall not propoſe however, to reduce it to $3\frac{3}{4}$ miles, as it is ſeen on Captain LARKINS's chart: this navigator did not paſs through the channel; from afar he eſtimated the diſtance from the one iſland to the other, while he lay aground on the WARREN HASTINGS's Shoal. It appears that he has judged no better of the diſtance from his ſhoal to TREE Iſland, on the one hand, and to GASPAR Iſland, on the other: and we muſt chooſe between his angles of bearing and his eſtimated diſtances, which it is impoſſible to make agree. But we cannot heſitate reſpecting the choice; the angles were meaſured *by the compaſs*, and this meaſure muſt be as exact as the nature of the inſtrument allows of, whereas the diſtances were eſtimated *by the eye*, and all ſeamen know that, eſpecially when ſmall iſlands are in queſtion, errors ſomewhat conſiderable may be committed in eſtimations of this nature.

We are convinced that the diſtance which LARKINS has eſtimated between TREE Iſland and GASPAR Iſland, is too ſmall, and thoſe which he has ſuppoſed between each of thoſe two points and the WARREN HASTINGS's Shoal, are ſo too. In order to learn by approximation theſe two laſt-mentioned diſtances, I have made uſe of the diſtance between the two iſlands, which I have before eſtabliſhed of 7.2 miles from *centre to centre*, and of their bearing ſouth 62° weſt and north 62° eaſt, which has been well aſcertained.

With theſe data and the angles of bearing taken by Captain LARKINS, from the place where he lay aground on the WARREN HASTINGS's Shoal to TREE Iſland, on the one hand, and on the other to the centre of GASPAR Iſland, we may fix the diſtance of the ſhoal to each of theſe points.

In

In order to abridge the discussion, I employ a figure which will be found on my chart *Plate VII.*

In the figure, let *w* be the Warren Hastings's Shoal, *r*, Tree Island, *g*, Gaspar Island.

The data are: 1. The angles of bearing measured from the ship when aground on the shoal, by Larkins, namely, the angle *s w r*, from the Warren Hastings's Shoal to Tree Island, from south to east 17°.

The angle *s w g*, from the Shoal to the Island, from south to east 70°.

2. The distance of the objects, r, g, from centre to centre, 7.2 miles.

3. Lastly the angle *e* r g of bearing, from Tree Island with respect to Gaspar Island, from east to north 28° the complement of 62 degrees, the angle of bearing from north to east.

We shall then know the three angles in the triangle *r w g*.

For, we have the angle *r w g*=70°—17°=53°: the angle *w g* a (the complement of a *w g* 70°)= 70; the angle a *g r* (alternate of *g r* e, 28°)=28°; and consequently the whole angle *r g w*=48°:

And the third angle *g r w* (supplement of the sum of the two former) equal to 79°.

In calculating the triangle according to the formulas of trigonometry, we shall find:

w g,

W G, diſtance from the SHOAL to the centre of GASPAR Iſland = 8.85 miles.
W R diſtance from the Shoal to TREE Iſland = 6.7 miles.

The former of theſe diſtances is, in LARKINS's Journal, 6 miles, and alſo 6 miles on his chart: the latter is 9 miles in the journal, and $5\frac{1}{2}$ on the chart.

As theſe diſtances were eſtimated by the eye, it is not ſurpriſing that there ſhould be an error in both; but we may be aſtoniſhed that the chart does not agree with the journal, neither as to the diſtances, nor as to the angles of bearing. I have, as I have ſaid, thought it proper to preſerve theſe angles ſuch as they were inſerted in the Journal; they were obſerved, and theſe are the only data of LARKINS on which it is poſſible to rely: but why did he not make uſe of them in conſtructing his chart? He gives no reaſon, and it is not poſſible for me to atone for his ſilence: it were to be wiſhed that Mr. DALRYMPLE, who has publiſhed the Journal and the chart, had explained himſelf reſpecting this want of agreement which certainly has not eſcaped him; and no one better than he could aſſign the cauſe of it, and rectify the chart and the journal. It is eaſy to conceive how greatly ſuch contradictions muſt embarraſs a navigator who has before him both the Plan, and the written data, according to which the Plan ought to have been conſtructed; they leave him in doubt to determine on which ſide the truth lies; he may even ſuſpect whether it be on either: and his embarraſsment here muſt be the greater, as, till now, the WARREN HASTINGS's Shoal is laid down only on LARKINS's chart, unleſs it be on ſome chart with which I am not acquainted, more recent than thoſe publiſhed by G. ROBERTSON in 1788 and 1790.

IV. On the chart No. 49, 2nd, making part of the *Supplement* of the ſecond

edition of D'APRÈS' *Neptune Oriental*, and of an earlier date than all the charts which I have quoted, is ſeen another ſhoal ſituated to the northward of the north point of GASPAR Iſland, at ten miles diſtance, meaſured between this point and the ſouth part of the ſhoal. CROZET's Track in the MASCARIN, in 1773, which is marked on this chart, paſſes only at the diſtance of 4 miles from the north part of the ſhoal which occupies 1 mile; and it may be preſumed that it is from the account of this navigator, that D'APRÈS has placed it: CROZET having paſſed only at the diſtance of 16 or 17 miles from the north point of GASPAR ought to have ſeen at the ſame time that iſland and the breakers of the ſhoal.

I find on DORDELIN's chart, (track going to CHINA) a ſhoal nearly in the ſame poſition: he places it to the north by weſt of the moſt northern part of GASPAR Iſland, and at the diſtance of about 10 miles, meaſured from the ſouth extremity of the ſhoal; he gives it 4 miles in extent from north by weſt to ſouth by eaſt. At its north extremity is delineated an iſlot; and DORDELIN ſays, in a note written on the chart, that *theſe are Rocks and Breakers even with the water's edge*, and that *the Rock is always above water*. DORDELIN's track, marked in the chart, extends along the ſhoal at the diſtance of about a mile from the breakers: and as he ſaw at the ſame time GASPAR Iſland, we may admit the poſition which he aſſigns to the ſhoal on his chart, relatively to the iſland, as well as the extent which he has given to it.

ROBERTSON's large Plan preſents to us two ſhoals in the ſame quarter, under the name of *Breakers:* the firſt to the north by weſt 1 or 2° weſt of the Peak of GASPAR Iſland, 7 miles from its north point: the ſecond to the north by weſt 4° weſt of the ſame Peak, and at $10\frac{3}{4}$ miles from the ſame point. The extent of theſe ſhoals is left undetermined on the Plan; they are merely indicated by a † ſurrounded by a dotted circle.

It

It is very probable that the moſt diſtant ſhoal is the ſame as that which DORDELIN examined and ranged along throughout its whole length: as for the ſecond, its exiſtence might appear doubtful. The French navigator had paſſed through the channel which ſeparates GASPAR Iſland from ROCHER NAVIRE or TREE Iſland; it was inſtanding to the north 5° weſt, that he perceived the breakers and the rock above water which he has laid down on his chart; and it would be aſtoniſhing if he had not alſo perceived the breakers neareſt to the iſland, which are laid down in ROBERTSON's Plan, in the ſame direction as the moſt diſtant ones, relatively to the iſland. I preſume that ROBERTSON has placed this ſhoal according to the Journal of the SULIVAN, Captain STEPHEN WILLIAMS, who, in 1784, on his return from CHINA, paſſed through GASPAR's Strait *. It is there mentioned that the following bearings were taken.

"At ½ paſt 9, A. M. ſaw *Breakers*, bearing N. ½ E. diſtant about 3 "miles, and appearing to be about 3 miles north from GASPAR Iſland, and "ſome *others* bearing W. S. W. about 6 miles. Likewiſe ſaw an Iſland "making like a ſail (this is ROCHER NAVIRE or TREE Iſland,) S. ½ E. diſtant "about 2 leagues, GASPAR Iſland then bearing S. E. diſtant 3 leagues. A "rock, off it, with *Breakers* all round it, bearing from the ſhip S. E. by S."

Theſe bearings, taken at the ſame moment, give room to make a few obſervations.

1. From the point whence GASPAR Iſland bore ſouth-eaſt diſtant 3 leagues, the SULIVAN ought to have ſeen TREE Iſland to the ſouth half eaſt;

* Mr. *Dalrymple* has given an extract from this Journal in one of the *Memoirs* o his Collection, the title of which is, *Appendix to Memoir of Chart of Sunda and Banca*, page 16.

 but

but the diſtance of this rock, which carries it only to 2 leagues, has been badly eſtimated; it was at 3, as well as the diſtance from GASPAR Iſland: in order to be convinced of this, it is ſufficient to prick off the bearings of GASPAR Iſland on our chart where the relative poſition of this iſland and of TREE Iſland is fixed according to the Bearings of WILSON, CHANAL, &c. It will be ſeen that the point of bearing of the SULIVAN is at *three* leagues' diſtance from TREE Iſland.

2. The point of this bearing may be equally well determined by the two bearings and the diſtance alone from GASPAR Iſland, although there is an error reſpecting the eſtimated diſtance from TREE Iſland; for it is well known that it is very uſual to eſtimate the diſtance too ſmall, when bearings are taken from a little iſland which is lofty; and the bearing with reſpect to TREE Iſland is exact, as well as the bearing with reſpect to GASPAR Iſland. In therefore admitting this bearing, let us look for the poſition of the *firſt Breakers*. It is ſaid that they were about 3 miles to the north half eaſt of the ſhip; and that GASPAR Iſland bore ſouth-eaſt, diſtant 3 leagues or 9 miles, the ſhip was therefore about $6\frac{1}{2}$ miles more to the northward than GASPAR Iſland: and as the breakers were ſtill about 3 miles more to the northward than the ſhip, they muſt therefore be $9\frac{1}{2}$ miles more to the northward than GASPAR Iſland. It is therefore evident that there is an error in the Journal, when it is ſaid there that the *Breakers* are about 3 *miles* to the northward of GASPAR Iſland; it was, no doubt, meant to ſay 3 *leagues* or 9 miles.

3. At preſent, I remark that the ſouth part of the breakers ſeen by DORDELIN, the ſame, according to every appearance, as thoſe ſeen before by CROZET, is diſtant about 10 miles from the north point of GASPAR; and that the extent of ſea which they occupy in breadth, is ſituated, with reſpect to the iſland, between the north by weſt and the north: thus, from the poſition where

where the SULIVAN was in regard to GASPAR Iſland, theſe breakers, if they be at the point where they are laid down on DORDELIN's chart, muſt have borne from the SULIVAN, from north-north-eaſt to north-eaſt, their ſouth part about 6 miles diſtant: and yet thoſe which he ſaw bore, it is ſaid in his Journal, north half eaſt diſtant only 3 miles.

We cannot therefore affirm poſitively that theſe breakers were the ſame as thoſe which DORDELIN ſaw; but ſtill leſs can we ſay that they are not the ſame; the SULIVAN's bearings appear not taken, or at leaſt ſet off with exactneſs, and can inſpire no great confidence: her commander may have been miſtaken here as elſewhere. It has been ſeen that her journal places theſe *breakers* 3 miles to the northward of GASPAR Iſland; and from thoſe very bearings is taken the proof that they muſt be diſtant from it 3 *leagues* or 9 *miles*; we cannot therefore place the SULIVAN's breakers 3 miles to the northward of GASPAR Iſland; and if, as we muſt conclude from her bearings, we carry them 9 or 10 *miles*, we fall on DORDELIN's Breakers, at leaſt as to the diſtance from GASPAR Iſland. I obſerve that if, independently of the latter, there exiſt others to the north half eaſt of the point from which the SULIVAN's bearings were taken of GASPAR Iſland and TREE Iſland, DORDELIN who, on ſailing from the middle of the channel which ſeparates them, conſtantly held a northerly courſe, muſt have paſſed very cloſe to the eaſtward of the SULIVAN's Breakers: and as he has laid down none on the chart, we are aſſured that he ſaw none.

However, as it is always a matter of conſideration to ſuppreſs a ſhoal, even when there are the moſt juſtifiable doubts reſpecting its exiſtence, I have thought it proper to preſerve, on my chart, that of the SULIVAN, becauſe I cannot ſuppoſe that Captain WILLIAMS has committed errors reſpecting all his bearings and all the diſtances which he has eſtimated: but, in order to

place

place this Shoal, I have paid no regard to the diſtance of 3 miles, evidently erroneous, at which he ſuppoſes GASPAR Iſland; but only to the poſition of the ſhip deduced from the angles of bearings taken, at the ſame time, from GASPAR Iſland, TREE Iſland, and the Shoal. What determines me to preſerve it, is, on the one hand, the bearing of the Shoal with reſpect to the ſhip, a bearing which does not agree with DORDELIN's Breakers: it is, on the other, becauſe DORDELIN tells us that the *rock to the northward is always above water*, and that, doubtleſs, Captain WILLIAMS of the SULIVAN would not have failed to make the remark; yet I admit that this laſt motive is weakened, if we notice that DORDELIN ſpeaks but *of one ſingle rock* above water; that he does not ſay that it is lofty; that he might probably have perceived it, becauſe he ranged along the Breakers from ſouth to north throughout their whole length; but that this rock may probably too not have been perceived by a ſhip that was at a ſomewhat great diſtance to the ſouthward of the Breakers. Be this as it may, I have laid down on my chart theſe Breakers of the SULIVAN, under her name; I am, however, far from believing their exiſtence, and much further ſtill, from vouching that I have not laid them down twice.

Let us now endeavour to fix our opinion reſpecting ſome other Breakers which bore from the SULIVAN *weſt-ſouth-weſt, at about 6 miles' diſtance*, at the ſame time that the former bore from her north half eaſt, diſtant 3 miles.

Admitting the poſition of the ſhip to be 3 leagues or 9 miles to the north-weſt of GASPAR Iſland, ſuch as it is given by the SULIVAN's Journal, ſhe ought to have been to the weſt-ſouth-weſt the northern part of the WARREN HASTINGS's Shoal; but the diſtance would be only 3 miles, and not 6, as it was eſtimated by the eye: for, if we choſe to admit this diſtance of 6 miles, the track of the ſhip WARREN HASTINGS which rounded the Shoal to the northward,

northward, after ſhe had been got off, would paſs over the ſhoal ſeen by the SULIVAN, if placed according to that ſhip's Journal *.

It appears to me nearly proved that theſe ſecond Breakers, ſeen from the SULIVAN to the weſt-ſouth-weſt of her poſition, are no other than a portion of the WARREN HASTINGS's Shoal, which may either be connected with the Shoal, or be ſeparated from it only by a channel. This opinion is alſo that of Mr. DALRYMPLE, who ſays, in a note, that he has added to the Journal of the CARNATIC, Captain WILSON, of which he is the Editor †, that "Captain LARKINS gives the Bearings of GASPAR ſouth 70° eaſt and TREE "Iſland ſouth 70° eaſt when *aground* (in the WARREN HASTINGS in 1788) "on an *extenſive Reef*, probably the *Breakers* ſeen by the SULIVAN, bear-"ing weſt-ſouth-weſt 6 miles diſtant, when GASPAR bore ſouth-eaſt and "TREE Iſland ſouth half eaſt." Captain WILSON, who paſſed through GASPAR's Strait in 1787, and was not acquainted with the ſhoal on which the WARREN HASTINGS ſtruck in 1788, was not willing to admit the exiſtence of the Breakers which had been ſeen from on board the SULIVAN in 1784. In page 37 of his Journal he tells us, "In reſpect to "the *Breakers* which they ſet weſt-ſouth-weſt 6 miles from them, when TREE "Iſland bore ſouth half eaſt and GASPAR Iſland ſouth-eaſt, I cannot but "think they were miſtaken, as, where there any exiſting, I muſt have paſſed "very near them, and have ſeen them." I obſerve that, in fact, on examining Captain WILSON's Track in the CARNATIC, it appears that he paſſed *very cloſe* to the weſtward of the WARREN HASTINGS's Shoal: but though he had paſſed cloſer to it ſtill, provided he did ſo without ſtriking, it would have

* In ſpeaking of the track of the *Warren Haſtings*, I do not mean that which is marked on Captain *Larkins's* Chart, but that which he ought to have followed, in fact, according to the data conſigned in his journal: theſe tracks differ rather conſiderably from each other.

† See page 35 of Captain WILSON's Journal.

 been

been very poſſible that he might not perceive it, ſince LARKINS had no knowledge of it till he ſtruck on it.

We may conclude, however, that, if the Breakers ſeen by the SULIVAN to the weſt-ſouth-weſt of her poſition, 3 leagues to the north-weſt of GASPAR, are, indeed, the ſame as the WARREN HASTINGS's Shoal, theſe *Breakers*, as the Capatin of the SULIVAN terms them, muſt needs *not break at all times*, ſince Captain LARKINS, who got aground on them *in the open day* and at low water, had not been apprized of their preſence by any ripling, nor even any change in the colour of the water: and his journal does not mention that, during the three days which he remained aground, he ever ſaw the ſea break on it. Neither does it appear that WILSON, who paſſed through GASPAR's STRAIT with the intention and the charge of examining every thing, and who muſt have paſſed very near the ſhoal, perceived, in this quarter any appearance, any indication of danger.

If theſe ſhoals or theſe breakers met with by the WARREN HASTINGS, and ſeen by the SULIVAN, never break, or do not always break, they are the more dangerous on that account: and, no doubt, it will not be matter of ſurpriſe that I have taken ſo much pains in endeavouring to aſcertain their exiſtence and fix their poſition. From every preſumption, which appears to unite in order to indicate the identity of the SULIVAN's *Breakers* and the WARREN HASTINGS's *Shoal*, I have thought it proper to confine myſelf to laying down the latter on my Chart; but as nothing proves that the extent which LARKINS has given it on his, is exactly that which the Shoal has received from Nature, I have likewiſe thought that I might take the liberty of altering it a little, in order that WILSON's Track, drawn according to his Journal, might not paſs over the weſt part of this ſhoal.

A note

A note of Mr. DALRYMPLE, inſerted in Captain WILSON's Journal, page 35, would ſeem to indicate other dangers to the weſt-north-weſt of GASPAR Iſland.

" The BELVIDERE," ſays he, " being at anchor in 10 fathoms in latitude " 2° 24′ ſouth by obſervation, GASPAR eaſt-ſouth-eaſt $3\frac{1}{2}$ leagues, TREE " Iſland ſouth by eaſt, had the *Shoal* about a cable's length diſtant; " north-" north-eaſt and ſouth-ſouth-weſt from the ſhip." They found the *ſhoal* " about 2 miles in length, in ſome places from 6 to 10 feet water, and " within *twenty yards'* diſtance 15 fathoms hard coral."

If we wiſh to look in the chart for the poſition of the BELVIDERE, ſuch as it is given in this note, with reſpect to GASPAR and TREE Iſland (without concerning ourſelves about her latitude *), we ſhall find that the ſhip was at anchor to the north-eaſt of the point where the WARREN HASTINGS got aground, and at the diſtance of half a mile from that poſition: and it does not appear to me doubtful that the ſhoal ſeen and ſounded by the BELVIDERE, was the ſame as that on which Captain LARKINS got aground.

* I obſerve that, if the latitude of *Gaſpar* Iſland, as I think I have proved (farther back, page 353 to 357) muſt be very near 2° 21′ ſouth; that of the *Belvidere*, of 2° 24′, although being announced as deduced from an obſervation, was not correct: for ſince *Gaſpar* bore from her eaſt-ſouth-eaſt, diſtant $3\frac{1}{2}$ leagues, ſhe was leſs to the ſouthward than the iſland by 4 minutes, and her latitude muſt be only 2° 17′.

It might be objected that her obſerved latitude does not deviate much from that of *Larkins*, who, by a mean between 3 obſervations taken on three ſucceſſive days, found 2° $22\frac{1}{3}$′ for the point of the ſhoal on which he was aground, nearly about the middle of its length; which would give the ſame latitude for the place of the *Belvidere*: but as it has been proved by the compariſon of other obſervations, made in more favourable circumſtances, the latitude of the place where the ſhip got aground, compared to that of *Gaſpar*, by Captain *Larkins*'s bearings, muſt be about 2° 18′, and if there be any doubt reſpecting this poſition, it would be better for the ſafety of ſhips coming from the northward, that the ſhoal ſhould be laid down too far to the northward, than that it ſhould be placed too far to the ſouthward.

Mr. DALRYMPLE continues: " Being at anchor in 16 fathoms, GASPAR " eaſt-ſouth-eaſt, 12 miles diſtant; TREE Iſland ſouth 20′ eaſt, about 10 " miles diſtant, a *Shoal of Rocks* weſt-north-weſt, with not more than 3 fa- " thoms in ſome places: it appears to be the length of half a mile."

If we ſet off theſe bearings and theſe diſtances on the chart, we find that this ſhoal is ſituated to the north-weſt of the place where the WARREN HASTINGS grounded, and at the diſtance of about a mile.

This ſhoal appears to be alſo the north part of the WARREN HASTINGS's Shoal, the ſame point that had been ſet by the SULIVAN to the weſt-ſouth-weſt of her poſition, when GASPAR bore ſouth-eaſt 3 leagues, and TREE ISLAND ſouth half eaſt. I would not, however, vouch for the identity; and I am entirely of the opinion of Mr. DALRYMPLE, who concludes his Note by ſaying that " Theſe ſeem to be ſtraggling *Shoals* with channels between, and " therefore, in the day-time, dangerous only by neglecting to keep a good " look-out from the maſt-head."

The inſtance of the WARREN HASTINGS might, however, prove that this precaution is not ſufficient, for ſhe got aground in *the day-time*. I think, with Mr. DALRYMPLE, that the great ſhoal ſituated about 3 leagues to the weſt-north-weſt of GASPAR Iſland, is not *a continued* ſhoal, but, if I may uſe the expreſſion, an *archipelago* of ſhoals the extent of which is not perhaps yet well known, and which leave, by intervals, deep channels through which ſhips might paſs, if ſome rocks above water ſerved as *Beacons* and pointed out to them the paſſages: but as the grounding of the WARREN HASTINGS proves that, at leaſt in ſome circumſtances, no rock breaks, we cannot but recommend to ſhips which ſhall have got ſight of GASPAR Iſland, and been able to fix their poſition in the chart, to paſs at ſuch a diſtance from the

place that the ſhoal there occupies, as not to have to dread it. The marked tracks of the navigators who have not met with ſhoals, and have not had ſight of them, may determine on that which a ſhip will have to keep in order to be certain of avoiding them.

I have thought it proper to lay a ſtreſs on the poſition of the ſhoals that may be ſituated from the north to the weſt-north-weſt, relatively to GASPAR Iſland, becauſe the uncertainty of their poſition and the fear of falling in with them during the night, in looking for the Strait BETWEEN BANCA AND BILLITON, muſt have hindered ſeveral navigators from preferring it, notwithſtanding its advantages to that of BANCA, which, beſides its inconveniences, has its dangers too: but as theſe dangers are better known, they were leſs feared.

I proceed to the diſcuſſion of the other points of the Weſt Paſſage or GASPAR'S STRAIT, of which it is neceſſary to fix the bearings and diſtances, in regard to each other.

V. THE EAST POINT of the Iſland of BANCA, which ſome navigators call its NORTH-EAST Point, forms with GASPAR Iſland the entrance of the WEST Paſſage; and, in the interval, lies TREE Iſland, nearer to GASPAR than to BANCA. The bearing of the EAST Point of the latter, with reſpect to the Peak of GASPAR, has been exactly determined by bearings taken when the two points were *in one*.

WILSON (page 2 of his Journal) ſays that "in paſſing betwixt the Eaſt "point of BANCA and GASPAR Iſland, he ſet at the ſame moment, the Peak "of the latter north 50° 30′ eaſt, and the point of the former ſouth 50° 30′ "weſt."

LARKINS

LARKINS, in the ſame poſition, page 20 of his Journal, ſet the Point of BANCA ſouth-weſt half weſt, and GASPAR north-eaſt half eaſt, or, in other words, ſouth 50° 45′ weſt and north 50° 45′ eaſt: and the bearing is the ſame on his chart.

Captain CHANAL, in a ſimilar poſition with reſpect to the two points, found that their bearing was north 53° eaſt and ſouth 53° weſt: this bearing was taken from the Peak of GASPAR, on the one hand, and on the other, from the hummock that riſes on the middle of the point of BANCA, which comes to nearly 57°, if we reduce this bearing to the eaſtern extremity of the coaſt.

We ſhall place the hummock of the EAST Point of BANCA with reſpect to the Peak of GASPAR, ſouth 53° weſt and north 53° eaſt.

This bearing is the ſame on ROBERTSON's Chart and great Plan, and on LARKINS's Chart; but on that of DORDELIN, it is ſouth 59° weſt.

VI. Captain WILSON, in employing various bearings taken from his Station *b* *, where he had obſerved the latitude 2° 49′, and in taking for a baſe a portion of the diſtance run by the ſhip in a determined direction, has made the latitude of the EAST Point of BANCA, 2° 33′; and it has been ſeen that he places GASPAR Iſland in his journal in 2° 22′, and on his chart in 2° 20′. The operations of Captain CHANAL gave him the ſame latitude of 2° 33′ for the EAST Point of BANCA; and this is that which he has employed on his chart where GASPAR is in 2° 21′, as he deduced it from his obſervations. The latitude of the ſame point is 2° 3′ 30″ on the chart of DORDELIN, who places the

* *See* farther on theſe Bearings.

middle

middle of GASPAR in 2° 25′ 15″ (2° 21′ 15″ according to his obſervations of 1784): 2° 38′ 30″ on that of LARKINS who places GASPAR in 2° 25′ 45″: and in 2° 42′ on that of ROBERTSON, who has given 2° 30′ for the latitude of GASPAR *. The reſults of theſe ſeven determinations give for the difference of latitude between the middle of GASPAR Iſland and the EAST Point of BANCA: 11′—13′—12′—9⅓′—12′—12¾′: the mean is 11′ 55″ or 12 minutes in round numbers; this is the difference of latitude that reſults from CHANAL's operations: this is that which ROBERTSON's Chart gives; and it is a mean between the two differences of WILSON. We may therefore conſider this difference of latitude as exactly determined.

If, with this difference of latitude of 12 minutes, or 12 miles, and the angle of bearing of 53° from north to eaſt; equally well determined (page 373) we wiſh to find by the calculation of the oblique triangles, the length of the hypothenuſe, we ſhall find 19.8 miles for the diſtance from the Peak of GASPAR to the hummock which riſes on the EAST Point of BANCA.

The diſtance is the ſame on WILSON's Chart, on that of CHANAL, on ROBERTSON's Chart and Plan; but it is from 21 to 22 miles on LARKINS's Chart and on that of DORDELIN.

This baſe whoſe length and direction are equally well determined, is that to which we ſhall reduce, by trigonometrical operations, all the Points of the WEST PASSAGE whoſe poſition it is of importance to fix.

VII. A mountain ſituated inland on BANCA, ſerving as a land-mark to ſhips coming from the northward.

* *See* farther back, page 355.

The

The position of this mountain is not susceptible of great precision. WILSON, being in a line with the East Point of BANCA and the mountain, set them, in one with each other, south 81° west: CHANAL, in a similar position, had set them south 78° 45′ west. The difference of 2° 15′ in the bearings of these two observers makes us presume (and other bearings of the mountain, taken from other points of the Strait, also indicate it) that it presents two summits which lie nearly east and west in regard to each other *, and it is not proved that the two observers have pointed to the same: besides, they may not have set the same point on the EAST Point of BANCA, which is a large round point, unequally elevated in its middle. Be this as it may, I have placed the hummock, or the Peak, the most eastern of the mountain, with respect to the point of the island, west 9° south, or south 81° west. This bearing is confirmed by another bearing of WILSON, who, from a station *G.* which is seen marked on his chart (in 18 fathoms), having GASPAR Island east-south-east half east, distant $9\frac{1}{2}$ miles, and TREE Island south-south-east $6\frac{1}{2}$ miles, set, at the same time, the mountain of BANCA west 33° south.

As to the distance from the mountain to the EAST Point of BANCA, WILSON, page 28 of his Journal, has made it, from his trigonometrical operations, 21.26 miles: this distance, on his chart, is that of the point of the island at the summit of the mountain; but that from the same point to the point of junction of his lines of bearing on the mountain, is 20.5 miles. I have placed the summit of the eastern hummock at 19.5 miles, because that is the distance given me by cross bearings, taken from different stations in the Strait.

This mountain is not comprehended in ROBERTSON's Plan. It is placed

* This remark is confirmed by a *View* of this mountain, taken by Captain *Chanal*, and which is to be found on my Chart, *Plate* VII.

on

on DORDELIN's chart to the ſouth 55° weſt, and at 33 miles' diſtance, from the EAST Point of BANCA: this diſtance and this bearing differ too much from the reſult of the operations of Captains WILSON and CHANAL, for us to pay any regard to a poſition which, no doubt, was determined from a mere view.

VIII. MIDDLE Iſland, (and according to WILSON, PASSAGE Iſland.)

This navigator from his ſtation *a** at anchor (in 8 fathoms water, to which the ſhip had ſhoaled, in three caſts of the lead to 20 fathoms) ſet the SOUTH-WEST Point of MIDDLE or PASSAGE Iſland ſouth 28° eaſt, at the ſame time that he ſet the EAST Point of BANCA north 28° weſt, which comes to 30° 30′ reducing the bearing to the hummock of the point; and he has (page 28 of his journal) made their diſtance 21.11 miles. The SOLIDE's journal gives us no bearing in the ſame poſition; but, on the chart that Captain CHANAL has conſtructed from thoſe which he took in other points of the Strait, the ſouth-weſt point of MIDDLE or PASSAGE Iſland lies, with reſpect to the hummock of the EAST Point of BANCA, ſouth 31 or 32° eaſt, which gives 28 or 29°; reducing the bearing to the eaſtern extremity of the point; and the diſtance

* The bearings which Captain *Wilſon* took from his ſtation *a*, are too important for any of them to be omitted.

" Gaſpar Iſland ..... N. 37° 30′ E.
" The South-weſt point of *Paſſage Iſland*, and the Eaſt Point of *Banca* in oppoſite bearings, eſtimated diſtance from the eaſt point 5 miles.... N. 28° W. & S. 28° E.
" The northern extreme of Paſſage Iſland ..... S. 50° 30′ E.
" *Mount Parmaſan* ..... N. 87° W.
" The ſouth-eaſt point of Banca ..... S. 5° 15′ E.
" One Iſland in the Bay ..... S. 10° W.
" The other ..... S. 22° W.
" Tree Iſland juſt viſible from the poop ..... N. 25° 30′ E.

(*Wilſon's* Journal, page 1.)

is 24 miles. The angle of bearing is 28° on ROBERTSON's Plan, and the diſtance is 16½ miles only: on DORDELIN's chart, the angle is 34° 30′, and the diſtance 22½ miles: on that of LARKINS, the angle is 38°, and the diſtance about 18 miles; but reſpecting this laſt, the SOUTH-WEST point of MIDDLE or PASSAGE Iſland is repreſented by a large maſs of ſhapeleſs land which is loſt in the frame of the chart.

I have preſerved the angle of 28° of WILSON's bearing, which was taken in a line with the two points, and which is 30° 30′, when reduced to the hummock; but having regard alſo to the angle from GASPAR and to other angles taken, other ſtations, in different points of the ſtrait, I have thought it proper to diminiſh to 20.2 miles the diſtance carried to the hummock, which in WILSON's Table of reſults, is 21.11 miles, reduced to the eaſtern extremity of the Point.

From the ſame ſtation, this navigator ſet the NORTHERN extreme of PASSAGE Iſland, ſouth 50° 30′ eaſt; which would place it ſouth 44° eaſt of the EAST Point of BANCA, and at the diſtance of 18.1 miles.

But the ſequel of WILSON's operations combined with thoſe of CHANAL, allows not this reſult to be adopted: it appears that, in reading the card of the compaſs, the obſerver has taken the complement of the angle for the angle itſelf, which he meant to inſert in his journal, and which muſt have been *Eaſt* 50° 30′ *ſouth*, or *ſouth* 39° 30′ *eaſt*. What proves it, is that, in employing conjointly the bearings of WILSON from his ſtation at 11 o'clock*, thoſe from his ſtation *b* at noon†; a bearing which he took, ſubſequently, from

* *Wilſon's* Journal, page 26. The bearings from this ſtation will be mentioned hereafrer.

† *Wilſon's* 2nd ſtation marked *b*, is that of the 25th of February at noon: the latitude obſerved there was 2° 49′ ſouth. "The baſe *a b*," ſays *Wilſon*, "is aſſumed upon a ſouth 13° eaſt "courſe,

from the ſouth-weſt Point of PASSAGE Iſland and the north-eaſt point of the ſame, north 26° eaſt*, and a bearing taken by CHANAL at 5 o'clock in the evening ‡, I have deduced the poſition of the moſt northern point of PASSAGE Iſland, as follows: with reſpect to GASPAR Iſland, ſouth 8° 45′ weſt, in regard to the hummock on the EAST Point of BANCA, ſouth 40° 30′ eaſt, at the diſtance of 18.2 from this laſt point; and 17.2 miles from the eaſtern extremity of the Point.

On ROBERTSON's Plan, the diſtance to the hummock on BANCA is 17.75 miles, and the angle of the bearing 58°; and in meaſuring from the extremity of the Point 13½ miles and 48° 30′: on DORDELIN's chart, the diſtance to the extreme Point, 18 miles; the angle 47°: on that of LARKINS, diſtance, 15 miles; the angle 48° 30′.

"courſe, diſtant 13 miles." We have before given the bearings taken from the point *a*; here are thoſe which were had from the point *b*.

"The *two Iſlands* in the *Bay*, in one ..... Weſt
"The north-eaſt end of *Paſſage* Iſland ..... N. 64° 41′ E.
"And the ſouth-weſt end of *It* ..... S. 66° E.
"Gaſpar Iſland (juſt viſible from the balcony) ..... N. 17° E.
"And the ſouth-eaſt point of Banca in oppoſite bearings eſtimated diſtance 5 miles. S. 17° E.
"*Mount Parmaſan* .....
"The hummock over the eaſt point of *Banca* .....
"The extreme Point not viſible from the deck .....
"The Eaſt Point is laid down by its bearings from Gaſpar Iſland which I obſerved in paſſing betwixt them, S. 50° 30′ W. and N. 50° 30′ E."

(*Wilſon's* Journal page 2.)

* *Wilſon's* Journal, page 28, left line of the Table.

† At 5 o'clock in the evening of the 22nd December, the *Solide* had the *Eaſt* Point of *Banca* bearing N. 35° W.—*Gaſpar* Iſland N. 22° E. The north-eaſt point of the peninſula S. 9° 30′ W. An iſland to the northward of this point from S. 40° to S. 48° W.—*Middle* or *Paſſage* Iſland from S. 25° to S. 52° E.

IX. Islands in the Bay or Gulf, ſituated to the northward of the Peninſula of Sel.

Wilson, from his Station *b* (page 378, note †) had the moſt eaſtern of the two iſlands which are ſituated to the northward of the peninſula bearing directly weſt; and, from this poſition, it concealed from his view the weſtern or ſmall iſland. From his Stations (ſee farther on), the ſouth-eaſt point of Banca, in one with the north-east of the peninſula, or, as Wilson expreſſes himſelf, the *Outer Iſland* in the *Bay*, north 34° weſt. Other bearings, taken previouſly from his ſtation a (farther back page 377, note *) of each of the two iſlands, of the ſouth-eaſt Point of Banca or north-eaſt Point of the peninſula, and at the ſame time, of the ſouth-weſt Point and northern Extreme of Paſſage Iſland, combined with the former and with the bearings taken by Captain Chanal *, have furniſhed the data neceſſary for placing exactly the two Iſlands in the Bay, as well with reſpect to the ſouth-eaſt point of Banca, as with reſpect to Passage Iſland, and the other Points determined in the Strait, by bearings already mentioned, or by thoſe which will be ſo hereafter. It reſults from theſe operations, that the eaſt coaſt of the large iſland is ſituated ſouth 6° 15′ eaſt of the hummock of the east Point of Banca; north 34° weſt of the north-eaſt point of the peninſula; ſouth 26° 30′ weſt of the Peak of Gaspar; weſt 9° 30′ north of the South-west Point of Passage Iſland: that the centre of the Iſland is diſtant 16 miles from the east Point of Banca; 31½ from Gaspar; and that it is, from coaſt to coaſt, diſtant 8½ miles from Passage Iſland.

* On the 22d, at 5 P. M. the Solide had the following bearings: the *Eaſt* Point of *Banca* N. 35° W.; *Gaſpar* Iſland N. 22° E.; the *North-eaſt* Point of the Peninſula S. 9° 30′ W.; an *Iſland to the Northward* of the Peninſula, from S. 40° to S. 48° W.; *Paſſage* Iſland, from S. 25° to S. 52° E. She anchored at 40 min. paſt 6; and from the anchoring place, the hummock on the *eaſt* Point of *Banca*, N. 21° W. *Gaſpar* Iſland N. 13° 30′ E.; the *Great Iſland in the Bay or Gulf*, from N. 68° W. to N. 77° W.

The

The ſmall or weſtern iſland, has been laid down, in regard to the large one, from a bearing taken by WILSON from his Station *a*, and a ſubſequent bearing when the middle of the ſmall iſland bore weſt of the northern part of the large one.

DORDELIN has laid down *three* iſlands, on an eaſt by north and weſt by ſouth line, in lieu of the *two* which are ſeen on WILSON's Chart and on that of CHANAL: the bearing of the moſt eaſtern of theſe iſlands, in regard to the *north-eaſt* point of the peninſula, differs little on his Chart from that given by the bearings of the two others; but thoſe of the ſtation *a* of WILSON who ſet, at the ſame time, the moſt eaſtern of his *two* iſlands, ſouth 10° weſt, and the weſtern, ſouth 22° weſt, (farther back page 377 note *) do not allow me to admit *three* iſlands in the direction which DORDELIN has given to them, ſince WILSON could not but have ſeen the third, when, from the northward whence he beheld them, he ſet the *two* iſlands which he has laid down on his chart. However, it is poſſible that there may be a third iſland; but, in this caſe, it muſt be much nearer the main land of the large iſland than the two others, and at the ſame time be ſufficiently near, for it to be confounded, to the eye, with the land, when WILSON at the ſame time ſet the two iſlands.

I pay no attention to the chart of LARKINS, who has laid down at random three large iſlands, occupying a ſpace of about 9 miles, between the north by weſt and north-weſt by weſt from the north-eaſt point of the peninſula of SEL, from which they are 8 miles diſtant.

On WILSON's Chart and on ROBERTSON's Plan, between the north-north-weſt and north-weſt by north of a point which might be taken for the NORTH-EAST Point of the Peninſula, and at about the diſtance of 6 miles from

from this point, are ſeen two iſlands which almoſt touch each other; but we are certain by the bearings taken by WILSON from his ſtation *a*, that theſe two iſlands muſt be ſeparated by a channel of $1\frac{1}{2}$ miles or 2 miles in width.

X. NORTH-EAST POINT of the Peninſula of SEL.

This Point forms with the SOUTH-WEST Point of PASSAGE Iſland, the narroweſt part of the WEST PASSAGE or GASPAR'S STRAIT. Captain WILSON from his ſtation *b* (ſee page 378 note †) ſet GASPAR Iſland north 17° eaſt; at the ſame time that he ſet the ſouth-eaſt point of BANCA, in oppoſite bearings, ſouth 17° weſt: and, from this ſame poſition, the ſouth-weſt end of PASSAGE Iſland bore from him ſouth 66° eaſt.

There is here a ſmall error in the bearing of the north-eaſt point of the peninſula: the ſequel of the operations of WILSON proves that the point which he ſet is the SOUTH-EAST, and not the NORTH-EAST Point. In the poſition he was in, they muſt have borne from him almoſt in one with each other, ſince the angles ſcarcely differ a degree; and, no doubt, WILSON ſet the latter point.

It therefore is the SOUTH-EAST point of the peninſula which I have placed ſouth 17° eaſt from the Peak of GASPAR, and the NORTH-EAST point is nearly 18°.

The NORTH-EAST Point, on CHANAL'S Chart, is ſituated in 18° 30′; it is 20 or 21° on that of DORDELIN, and in 27° on that of LARKINS. The configuration of the lands, in this part, is ſuch, on ROBERTSON'S Chart and Plan, that it is not poſſible to diſtinguiſh a NORTH-EAST point; we ſee only that, in taking in a lump this projecting part of BANCA, its bearing with

reſpect

respect to GASPAR Island agrees *nearly* with that which results from the Bearings of WILSON and CHANAL.

According to the position before given to the SOUTH-WEST Point of Middle or PASSAGE Island, this Point and the north-east point of the Peninsula of SEL, ought, according to WILSON, to bear, with respect to each other (page 28 of his Journal) south 74° west and north 74° east; but, to adopt this bearing of the one point in regard to the other, we should necessarily alter the positions already fixed by other bearings, as well with respect to GASPAR Island, as with respect to the EAST Point of BANCA, and particularly that of the SOUTH-WEST Point of PASSAGE Island which is one of the most certain; and we have no reasons that can dictate, or even authorize these changes. In maintaining the first positions, I found that the two points which we wish to place, lie with respect to each other south 56° 15′ west and north 56° 15′ east: the difference, on a comparison with the bearing given by WILSON, is considerable, it is 17° 45′; but the width of the passage, from coast to coast, which is the essential point, differs on my chart, from that given by WILSON's result, only by being 6 miles instead of 6.2 miles, so that they may be said to be the same.

On examining whence this difference of 17° 45′ may arise, between the bearing indicated by WILSON, in his *Table of Bearings and Distances* (page 28 of his Journal) and that which I have employed on my chart, I have thought I discovered that it proceeded from a bearing taken from his station *b* (*see* page 378 note †) from which he set the SOUTH-WEST Point of Passage Island South 66° east. In the position he was in with respect to this island, the *south-west* point and *southernmost* point must have borne from him, nearly, in one with each other; and surely he set the last point that he had in sight, since he mentions but one: now the last point must be the *southernmost*, and not

not the SOUTH-WEST point: and they are diſtant from each other, 3 miles, in the direction of 66° ſouth-eaſt, and 66° north-weſt. The ſequel of WILSON's operations, combined with thoſe of CHANAL, will prove that the preſumed error muſt have taken place.

The width of the ſtrait is greater on all the other charts than on WILSON's and mine; on that of CHANAL who places the north-eaſt point of the peninſula with reſpect to the ſouth-weſt Point of PASSAGE Iſland, nearly in the ſame bearing as that which I give to them, the diſtance is 9 miles; it is upwards of 10 miles on that of DORDELIN; 12¾ miles on that of LARKINS's, and 9¼ miles on ROBERTSON's Chart and Plan. But we may be certain that all theſe diſtances are too great; for the bearings of the two points which form the narroweſt part of the paſſage, taken in oppoſite ſituations, namely; on the one part, the north-eaſt point of the Peninſula of SEL and the Peak of GASPAR ſouth 18° eaſt (farther back page 382) and on the other the SOUTH-WEST Point of PASSAGE Iſland and the eaſt Point of BANCA ſouth 28° eaſt and north 28° weſt (farther back page 377), admit not of giving more than 6 miles opening to the paſſage between the NORTH-EAST Point of the Peninſula of SEL and the SOUTH-WEST Point of PASSAGE Iſland.

XI. EAST COAST of the Peninſula of SEL.

Bearings taken by WILSON from his ſtation *c* * give us for the extent of the

* " *c* WILSON's third Station of which is aſſumed from the Bearings
" Of the South-eaſt point of *Banca*..... N. 56° W.
And the Southernmoſt Point of *Paſſage* Iſland ..... N. 5° W.
" by which," ſays he, " we muſt have had a ſtrong current to the S. E. Hence
" The Eaſtern Extreme of *Paſſage* Iſland bore..... N. 33° E.
" And the South Point of *Banca* bore..... Weſt
which had before been obſerved in one with the South-eaſt Point ..... S. 11° W.
" The

the eaſt coaſt of the Peninſula $4\frac{1}{2}$ miles; and a preceding bearing of its north-eaſt and ſouth-eaſt points, in one, determine their relative poſition, ſouth 11° weſt, and north 11° eaſt.

This bearing is the ſame, within one degree, by the bearings and on the chart of CHANAL; but the diſtance of the two Points, or the length of the coaſt is there carried to $8\frac{1}{2}$ miles: on DORDELIN's chart, the bearing is that of WILSON, and the diſtance 7 miles: on ROBERTSON's chart and plan, the bearing, if the configuration of the lands admitted of aſſigning one, would ſeem to be ſouth 11° eaſt and north 11° weſt, rather than ſouth 11° weſt and north 11° eaſt; but the diſtance cannot be meaſured there, for we are at a loſs where to find the north-eaſt point. The bearing is ſtill more erroneous on LARKINS's chart than on the preceding; the two points are placed, in regard to each other, ſouth 22° eaſt, and north 22° weſt: but it appears, in general, that this navigator had no other intention than to mark his track on his chart, and to lay down on it the ſoundings which he took in the WEST PASSAGE, without concerning himſelf, in any way, with the relative bearings of the points, and the configuration of the lands which ſeem to be traced nearly at random.

Captain CHANAL obſerves that, in the Chart of *Gaſpar's Strait* inſerted in D'APRÈS' *Neptune Oriental* (N°. 48 of the 2d Edition) by which the SOLIDE

" The South-weſt Point of *Banca* ..... S. 73° W.
which had been obſerved in one with the South Point ..... S. 67° 20′ W.
" A ſmall Iſland ..... N.E. by F.
" Another ..... N.E. by E. $\frac{1}{2}$ E.
" Another ..... E.N.E.
" Another ..... E. by N.
" And another ..... from E. $\frac{1}{2}$ N. to E. by S."
(*Wilſon's* Journal, page 2.)

 regulated

regulated her courſe, and of which all the French navigators make uſe, is laid down a great number of iſlands on the eaſt coaſt of the peninſula; but that he perceived none, although the ſhip had ſailed at no great diſtance from the coaſt: he only ſaw a few breakers or rocks *quite cloſe in ſhore:* DORDELIN's chart, WILSON's, LARKINS's, and thoſe of ROBERTSON indicate no iſland on the eaſtern coaſt of the Peninſula; and we are at a loſs to conceive how Captain GASPAR could have ſeen any: the different time of tide may occaſion a navigator, in paſſing, to ſee or not to ſee Breakers very near the ſhore, which are either under or above the ſurface of the ſea, according as it is high or low water; but an archipelago, ſuch as that which GASPAR has repreſented on his chart, is viſible at all times, if, in fact, it exiſt.

We ſhall conſider the diſtance of 6 miles, from the north-eaſt Point of the Peninſula of SEL to the ſouth-weſt point of MIDDLE or PASSAGE Iſland as a new *Baſe* the direction of which is north 56° 15′ eaſt and ſouth 56° 15′ weſt.

WILSON's ſtation *c* has been ſubjected on my chart to the poſition which his bearings give relatively to theſe two points: to ſouth 56° eaſt from the north-eaſt point of the peninſula; to ſouth 5° eaſt from the moſt ſouthern point of PASSAGE Iſland. I ſhall reduce to theſe ſame points the different points whoſe poſitions we ſhall now endeavour to fix.

XII. SHOAL and BREAKERS to the north-eaſt of the north-eaſt point of the Peninſula of SEL.

We are indebted to Captain LARKINS for a certain knowledge of theſe ſhoals on which his ſhip touched, but without ſticking faſt. Having immediately come to the wind, and dropped an anchor, he took from the anchoring-place the following Bearings (page 21 of his Journal.)

The

The SOUTH-EAST of the Peninſula ..... S.S.W.
Its NORTH-EAST Point .... S.W. by S.
A cluſter of *Rocks*..... S. by W. $\frac{1}{2}$ W.
A ſingle *Rock*..... ..... S. by E.
Northernmoſt extremes of the Iſland (the eaſtern iſland in the gulf) off the N.E. end of *Sel*. ..... N.W. by W. $\frac{1}{2}$ W.
Diſtant from the Peninſula 4 miles (eſtimated by the eye.)

He got under way again, and, ſtanding on, he had the cluſter of Rocks, in one with the NORTH-EAST Point of the Peninſula, bearing ſouth-weſt.

It is from theſe bearings that I have laid down on my chart Captain LARKINS's reef, or the WARREN HASTINGS's Shoal, by reducing it to the points already determined of the Peninſula; and it reſults from the poſition which this operation has given them, that the middle of the cluſter of rocks is ſituated to the north-eaſt of the NORTH-EAST Point at the diſtance of $2\frac{1}{2}$ miles. As for the detached and ſolitary rock, its bearing with reſpect to the NORTH-EAST Point is not certain; but its diſtance from this Point ought not to be leſs than $2\frac{1}{2}$ miles.

Captain LARKINS, from an ocular eſtimation, has placed on his chart the cluſter of Rocks, taken at its exterior north-eaſt part, at the diſtance of $3\frac{3}{4}$ miles from the NORTH-EAST Point of the Peninſula; but his bearings, reduced as well to this Point as to the SOUTH-EAST Point and the large iſland in the gulf, admit not of carrying this diſtance to more than $2\frac{1}{2}$ miles.

On DORDELIN's chart is ſeen a ſomewhat conſiderable extent of Breakers laid down at about the diſtance of $3\frac{1}{2}$ miles to the north and north by eaſt of the NORTH-EAST Point of the Peninſula: there can be no doubt of theſe

being the ſame as thoſe on which the WARREN HASTINGS rubbed her keel, which, fortunately for her, touched only on the edge of the Shoal.

It appears that the ſea does not always break on the north-eaſt extremity of the ſhoal, ſince LARKINS touched on it, without any thing having announced to him the vicinity of danger.

XIII. We are come to the group of ſmall iſlands, ſituated to the ſouth-eaſt of MIDDLE or PASSAGE Iſland, which, with the ſmall iſland, forms the the EAST PASSAGE; or CLEMENTS' STRAIT. This group is compoſed of ſeven iſlands which may be ſeparated into two groups: the firſt or *Weſt* group, compriſes four iſlands; the ſhip ATLAS, Captain COOPER, and the ROYAL ADMIRAL, paſſed between this group and MIDDLE Iſland: the ſecond, or EAST group, is compoſed only of three iſlands; the ſhip VANSITTART, Captain CLEMENTS, and the fleet under his command, paſſed between this ſecond group and the *weſt* group.

But, before we endeavour to fix the poſition of both groups with reſpect to MIDDLE or PASSAGE Iſland, and their poſition relatively to each other, it is proper to ſettle the name that is to be applied to each of the iſlands; for the want of agreement between the Engliſh navigators, who have impoſed names on them, might lead to an error.

In the weſt group, compoſed of four iſlands, the moſt weſtern of the two northern iſlands is named by ROBERTSON SANDY Iſland, and by COOPER, SANDY BEACH Iſland: the moſt eaſtern is called BUTTON Iſland by COOPER and BARN Iſland by ROBERTSON. The difference between the names given to theſe two northern iſlands is of no conſequence; it may eaſily be remembered that the iſland called by the one BUTTON Iſland, is called by the other

BARN

BARN Iſland, &c. But this is not the caſe with the two ſouthern iſlands of this ſame group, becauſe the two navigators have impoſed the ſame names on the two iſlands, but not the ſame name on the ſame iſland; which would lead into an error the geographer or the ſeaman who, wiſhing to reduce to theſe iſlands, on ROBERTSON's Chart and Plan, the bearings which are to be found in COOPER's printed journal, ſhould apply them to the one iſland, while they ought to be applied to the other. COOPER gives to the moſt ſouthern iſland of the *weſt* group, which is alſo the moſt ſouthern of the ſeven iſlands, the name of SADDLE Iſland, " ſo called," ſays he (page 21 of his journal) " from " having that appearance:" and " to the north-eaſt of SADDLE Iſland," adds he, " there is a low iſland," which, on his chart, he names FLAT Iſland. Theſe two names are interchanged on ROBERTSON's Chart and Plan: he gives the name of SADDLE Iſland to the ſmall low iſland to the north-eaſt COOPER's FLAT Iſland, and that of Low Iſland to the ſouth iſland, the largeſt of the two ſouthern iſlands, which is remarkable from a particular configuration, inſomuch that it has induced COOPER to impoſe on it the ſignificative name of SADDLE Iſland. I am of opinion that the denominations employed by COOPER ought to be preferred to thoſe of ROBERTSON; and I ground the preference on the following circumſtances. Firſt, I ſee that COOPER has drawn on his chart, at the northern extremity of his SADDLE Iſland, *two hummocks*, at no great diſtance from each other, which may, in fact, preſent themſelves under the form of *a ſaddle*; while the iſland to which ROBERTSON has given on his charts the name of SADDLE Iſland, is there preceded, in its eaſt part by a ſand-bank adjoining to the iſland, and ſhewing ſome rocks off which the VANSITTART anchored: does not this latter iſland appear likely to be a *low* or *flat* iſland, rather than that which is remarkable from *two hummocks?* In the ſecond place, I ſee on the chart of DORDELIN who, like COOPER, had entered from the ſouthward, that on the moſt ſouthern iſland of the weſt group which the latter has named SADDLE Iſland, the French navigator alſo repre-

ſeen *two hummocks*, and that he calls it L'ILE AUX MAMMELLES, and I obſerve that this is the only one of the ſmall iſlands ſituated to the ſouth eaſt of MIDDLE Iſland, on which DORDELIN has impoſed a name, becauſe, no doubt, it is the only one that is remarkable: I obſerve too that it is the moſt ſouthern iſland of the two groups taken together, like COOPER's SADDLE Iſland, like ROBERTSON's Low Iſland, I am therefore of opinion that there may have been a miſtake in writing the names on the charts of this latter navigator; and I ſhall name on my chart, and in the ſequel of this analyſis, SADDLE Iſland or ILE AUX MAMMELLES, the moſt ſouthern of the iſlands of the weſt group; and FLAT Iſland, that which lies to the north-weſt of the former. Of the two northern iſlands of the ſame group, the weſtern one will be named SANDY BEACH Iſland, and the eaſtern BUTTON Iſland, a denomination which appears to me to be more ſuitable than that of BARN Iſland, becauſe COOPER ſays that this Iſland has *a round form*. It may be remarked that this navigator (page 21 of his Journal) obſerves that "SADDLE Iſland loſes that form as it "draws to the eaſtward, and then looks moderately high and well wooded." It is probable that ROBERTSON who may have ſeen it when it bore weſt of him, and who thence ſtood to the ſouthward, may not have remarked the two hummocks which preſented themſelves to DORDELIN and COOPER, when, in coming from the ſouth-weſt, both of them had the iſland bearing north-eaſt: we may, however, be ſurpriſed at the hummocks not having been perceived and noticed by ROBERTSON, who anchored at about the diſtance of 4 miles to the ſouth eaſt by eaſt of his Low Iſland, DORDELIN's ILE AUX MAMMELLES, COOPER's SADDLE Iſland*.

The denominations of the three iſlands which form the eaſt group alſo

* The difference of the names given by *Robertſon*, and of thoſe which are met with on the Chart and in the Journal of *Cooper*, is to be found the ſame on the copy of *Robertſon*'s Plan which Mr. *Dalrymple* had publiſhed in 1786, in his *Collection of Plans*.

give

give occaſion for a few remarks. They are diſpoſed in the form of a triangle: of the two weſtern iſlands, the moſt northern is named on the charts NORTH Iſland and ſometimes THWART-THE-WAY Iſland; the ſouthern is called every where SOUTH Iſland; the third iſland, ſituated to the eaſtward of the middle of the firſt two, bears on ROBERTSON's charts, the name of TABLE Iſland. This laſt, which its name indicates as likely to be a flat and level iſland, is not laid down on COOPER's chart, nor is it mentioned in his journal: it was concealed from his view by the firſt two, and may not have been perceived at the diſtance at which, by his track, he muſt have paſſed from it.

COOPER's Track paſſes, as I have ſaid, between the weſt group of the ſmall iſlands and MIDDLE Iſland; it leaves to the eaſtward SANDY-BEACH, and to the northward of this iſland, the breakers which I have laid down on my chart, and which are not inſerted in COOPER's. Theſe breakers are taken from the chart and plan of ROBERTSON, who has there marked the Track of the ATLAS, Captain COOPER; they are placed to the eaſt-ſouth-eaſt of the ſouth-eaſt point of MIDDLE Iſland, and to the north-north-weſt of BUTTON Iſland (ROBERTSON's BARN Iſland.) There appears only, in COOPER's chart, nearly in the ſame poſition with reſpect to MIDDLE Iſland, a place indicated by a dotted circle; and it is ſaid in the Notes which are engraved on the chart, that in this place, COOPER ſaw the water of a green colour: but St. BARBE, commanding a Portugueſe ſhip in company with which he paſſed through the ſtrait, told him that the ſea was often ſeen to break there. ROBERTSON lays down, two miles to the northward of theſe breakers, on the very track of the ATLAS, an anchor which indicates that this ſhip anchored in the place which it occupies; and there are other breakers marked within leſs than the diſtance of a mile to the weſtward of the poſition indicated by the anchor. As Captain COOPER has neither marked,

on

on his chart, this anchoring-place, nor the ſecond breaker to the eaſtward of it, I have thought it proper not to lay it down on mine; and I have preſerved there only the firſt breakers of which the Portugueſe captain has furniſhed the indication. I obſerve that, between SANDY-BEACH Iſland and the ſouth part of theſe Breakers, there is drawn on ROBERTSON's chart and plan the track of the ROYAL ADMIRAL, which paſſes between the breakers and the iſland, croſſing from north-eaſt to ſouth-weſt*.

The relative poſition, with reſpect to each other, of the two groups which I have juſt deſcribed, and their reſpective poſition in regard to MIDDLE Iſland, is what it is of moſt importance to fix, in order to ſucceed in drawing a Plan of the EAST PASSAGE or CLEMENTS' STRAIT.

Unfortunately the charts which have been given us by ROBERTSON, WILSON, and COOPER differ conſiderably from each other reſpecting the relative poſition of the ſmall groups and of MIDDLE Iſland. The Journal of the ſhip VANSITTART, Captain CLEMENTS, on board of which G. ROBERTSON drew his plan of CLEMENTS' STRAIT, has not been publiſhed, at leaſt this journal is not compriſed in the number of thoſe for the publication of which we are indebted to the zeal of Mr. DALRYMPLE; and we are reduced to take from the very charts of ROBERTSON, the bearings and diſtances; but it cannot be doubted that this navigator ſubjected them to the angles which he had meaſured.

* Captain *Cooper* certainly mentions, in his log-book *(page 20 of his Journal)* having come to an anchor in 22 fathoms, on the 7th of Auguſt, at 8 P.M. but, on calculating the courſes given in this ſame log, from his firſt ſtation, at noon of this day, in 3° 20' latitude obſerved, till 8 P. M. and in ſetting off the reſult on his chart, we find that he muſt have anchored $10\frac{1}{3}$ miles to the north 8° eaſt of the northern Point of his *Sandy Beach* Iſland; whereas, on *Robertſon*'s chart and plan, the indication of the anchorage is $6\frac{3}{4}$ miles diſtant from this ſame point, and directly north. *Cooper* does not ſay that, from the place where he brought up, there were breakers to the eaſtward at leſs than the diſtance of a mile, as they are ſeen on *Robertſon*'s chart.

It

It has been ſeen (farther back, page 384, note *) that WILSON, from his ſtation *c*, whence he ſet the ſouth-weſt point of MIDDLE Iſland north 5° weſt, and the ſouth-eaſt point of the peninſula of SEL directly weſt, had at the ſame time the eaſtern extreme of MIDDLE Iſland bearing north 33° eaſt, and an iſland, which is SANDY BEACH Iſland, north-eaſt by eaſt, or north 56° 15′ eaſt.

From his ſtation *d**, whence he ſet the SOUTH-WEST point of PASSAGE Iſland directly north, and the SOUTH-EAST point of the peninſula (in one with the north-eaſt end of the *Outer Iſland* in the *Bay*) north 34° weſt, he had, at the ſame time, a very ſmall iſland (SANDY BEACH) bearing north-eaſt by north, or north 33° 45′ eaſt.

It is from theſe bearings that Captain WILSON muſt have conſtructed the part of his chart that preſents the channel or open paſſage between MIDDLE or PASSAGE Iſland and SANDY-BEACH Iſland, which is the neareſt. The ſouth part of PASSAGE Iſland preſents on this chart a ſtraight coaſt which extends about 5 miles on an eaſt and weſt line, declining only 2 or 3 degrees from the eaſt towards the north: this configuration differs from that which all

* From the ſtation *d*, *Wilſon* had the following bearings *(page 3 of his Journal)*

The in one with the north-eaſt end of the *Outer Iſland* in the *Bay*	N. 34° W.
The ſouth-weſt of *Paſſage Iſland*	North.
The ſouth-weſt point of	S. 87° W.
A remarkable hummock upon *Banca* (which had been obſerved in one with the *Outer Iſland* in the bay S. 50° W.)	N. 81° W.
A very ſmall iſland	N. E. by N.
Another larger	N. E. ½ N.
Another	N. E. ¾ N.
Another ſtill larger, with one beyond it, in one with it	N. E. by E.
Another (from the maſt head) about	E. by S.
Another (from the deck looking like a ſail) very diſtant	S. E. ½ E.

 the

the other charts have given of this part of the iſland, and from that which it muſt have from good bearings that determine the poſition of the ſouthernmoſt point of the iſland in regard to its ſouth-weſt point. Be this as it may, if we take, on WILSON's chart, the ſhorteſt diſtance from PASSAGE Iſland to SANDY BEACH Iſland, and the relative bearing of the two points of the ſhorteſt diſtance, we find that the width of the channel there is $3\frac{2}{3}$ miles, and that the bearings, on this line, is ſouth 5° 30′ eaſt, and north 5° 30′ weſt.

On COOPER's chart, which is exactly ſubjected to the bearings which he took*, the width of the channel is 5 miles, and the bearing of the two points at the ſhorteſt diſtance, ſouth-eaſt and north-weſt, or 45 degrees.

On ROBERTSON's chart and plan, the ſhorteſt diſtance is, on the Plan, $6\frac{1}{3}$

* STATION II.

Saddle Iſland diſtant 6 leagues..... N. 45° E.

STATION III.

Saddle Iſland ..... E. 26° N.
Sandy Beach Iſland..... N. 28° E.
Middle Iſland..... from N. 9°E. to N. 11° W.

STATION IV.

Saddle Iſland..... from S. 75° E. to E. 5° N.
Flat Iſland..... E. 10° N.
Middle Iſland..... from N. 5° E. to N. 25° W.

STATION V.

Sandy Beach Iſland..... S. 32° E.
Saddle Iſland..... E. 39° S.
Button Iſland..... E. 25° S.
Middle Iſland..... from N. 2° W. to N. 43° W.

STATION VI.

Sandy Beach Iſland..... S. $8\frac{3}{4}$° W.
Button Iſland..... S. 6° E.
Flat Iſland..... S. 32° E.

(Cooper's *Journal* page 20 to 23)

miles,

miles, and 7 miles on the chart; and the bearing, ſouth 28° 30′ eaſt, and north 28° 30′ weſt on the Plan; and 37° 30′ on the chart.

But on ROBERTSON's Plan, publiſhed by Mr. DALRYMPLE in 1786, the diſtance is $5\frac{1}{2}$ miles, and the angle of bearing 19°.

Thus the four Plans or Charts which I have quoted give us the following reſults:

			Width of the Channel.	Bearing of the Points at the ſhorteſt Diſtance.
			Miles.	Degrees.
Wilſon's Chart			3.66	$5\frac{1}{2}$
Cooper's Chart			5.00	45
Robertſon's	1786		5.50	19
	1788	Plan	6.33	$28\frac{1}{2}$
		Chart	7.00	$37\frac{1}{2}$

Theſe determinations differ too much between them for us to endeavour to reconcile them, or for us to be able to content ourſelves with taking a mean between the reſults. It has therefore been neceſſary to recur to other means for fixing the poſition of SANDY BEACH and SADDLE Iſlands with reſpect to MIDDLE Iſland: theſe Iſlands which are the weſternmoſt of the group of the ſeven iſlands which form the EAST Paſſages, will be found connected in a manner ſufficiently exact, as well to MIDDLE Iſland as to the Peninſula of SEL, which are themſelves connected by good operations to the EAST Point of BANCA and GASPAR Iſland; and the Poſition of the group very well determined will identify, if I may uſe the expreſſion, the Plan of CLEMENTS' STRAIT with that of GASPAR's STRAIT.

Let us begin by fixing the poſition, with reſpect to the Peninſula of SEL,

of the ſouthernmoſt Point of MIDDLE Iſland, which is not its ſouth-weſt Point, and which may be ſaid to belong equally to both STRAITS.

On the 23rd of December 1791, at 22 minutes paſt 7 A. M. Captain CHANAL, from on board the SOLIDE, ſet at the ſame time the SOUTH-EAST Point of the Peninſula of SEL ſouth 54° weſt, and the ſouthernmoſt Point of MIDDLE Iſland north 55° eaſt; and as, at that moment, the ſhip was at nearly an equal diſtance from the two points ſet, we may admit that theſe two points lie, with regard to each other, north 54° 30′ eaſt, and ſouth 54° 30′ weſt.

An hour after this firſt bearing (at 20 minutes paſt 8) the ſouth coaſt of MIDDLE Iſland, compriſed between its SOUTH-WEST Point and its moſt eaſtern Point on the ſouth ſhore, bore from north 11° 30′ eaſt to north 32° eaſt.

The bearings taken at theſe two periods being combined, they fix both the extent of the ſouth coaſt of MIDDLE Iſland, which preſents itſelf to a ſhip coming from the ſouthward, and the poſition of the SOUTHERNMOST Point of that iſland in regard to the Points of the Peninſula of SEL, already determined, and more immediately, in regard to its SOUTH-EAST Point: we find that the latter point lies, with reſpect to the ſouth point of MIDDLE Iſland, ſouth 43° weſt and north 43° eaſt: that their diſtance is $10\frac{3}{4}$ miles, and that the extent of the ſouth coaſt of MIDDLE Iſland is 3.6 miles.

On the other hand, WILSON, from his ſtation *b* (farther back, page 378 and 379, note †, and 383) ſet the ſouthernmoſt end of MIDDLE or PASSAGE Iſland in ſight ſouth 66° eaſt; and as this ſtation is fixed by good bearings, as well in regard to MIDDLE Iſland and the Peninſula of SEL, as with reſpect to the hummock on the EAST Point of BANCA, and with reſpect to GASPAR Iſland; it follows that, if, from this ſtation, we draw a line whoſe direction is ſouth 66° eaſt,

66° eaſt, we cannot carry any portion of the ſouth coaſt of MIDDLE Iſland more to the ſouthward than this line of bearing, which agrees perfectly with the reſult of CHANAL's bearings.

This argument confirms the neceſſity of the correction which I have before made (page 383) to one of WILSON's Bearings, by ſubſtituting the *ſouthernmoſt* Point of PASSAGE Iſland (that which he muſt have ſeen from his poſition) to the SOUTH-WEST Point mentioned in his Journal; and, in fact, if the bearing of north 74° eaſt, and ſouth 74° weſt, aſſigned by WILSON, between the north-eaſt point of the Peninſula of SEL and the SOUTH-WEST Point of PASSAGE Iſland, be applied on my chart to the NORTH-EAST Point of the peninſula and the ſouthernmoſt Point of the iſland, it will be found that this bearing agrees with all the reſults of my labour.

WILSON, from his ſtation *c* (farther back, page 384, note *) ſet the eaſternmoſt entrance in ſight of the ſouth coaſt of PASSAGE Iſland north 33° eaſt; but the agreement of the bearings which I have mentioned above, proves that there is an error in the meaſure of the angle, or rather a fault in the copy, and that this angle ſhould be 23 degrees in lieu of 33.

After having thus fixed the extent of the ſouth coaſt of PASSAGE or MIDDLE Iſland, and the poſition of the ſouthernmoſt Point in regard to the SOUTH-EAST Point of the Peninſula of SEL, it remains for us to determine the bearings in regard to MIDDLE Iſland of the weſternmoſt iſlands of the group which forms the EAST Paſſages: in order to accompliſh this, I ſhall make uſe of various bearings taken from the Journals of Captains WILSON, COOPER, and CHANAL.

WILSON, from a Station of the 26th of February, at 11 A. M. which is well

well fixed by bearings taken at the ſame time of four Points already determined (the eaſt Point of BANCA, GASPAR Iſland, the eaſtern iſland in the gulf, and the north-eaſt point of the Peninſula of SEL *) alſo ſet the weſt coaſt of MIDDLE or PASSAGE Iſland, namely, the northern extreme in ſight, ſouth 79° eaſt, and in one with the ſouthern extreme (which from his poſition muſt be the SOUTH-WEST Point of the iſland) a ſmall round iſland ſouth 42° eaſt: this was the only land that he then ſaw more to the eaſtward than PASSAGE Iſland. This ſmall iſland which was ſeen in the direction of ſouth 42° eaſt with reſpect to the SOUTH-WEST Point of MIDDLE Iſland, could be no other than SANDY BEACH, or SADDLE Iſland, or perhaps both in one; for they lie from each other on the ſame point of the compaſs.

The linear direction which this laſt of WILSON's bearings gives us, fixes the limit of the ſmall weſternmoſt iſlands of the ſouth-eaſt group; they cannot be carried within the line of ſouth 42° eaſt, down from the SOUTH-WEST Point of MIDDLE Iſland nearly through the middle of theſe two iſlands.

Captain CHANAL, from the anchoring-place of the 22nd of December in the evening, the point of which is fixed by his bearings of Points already determined, had in ſight four of the iſlands of the ſouth-eaſt group, and the

* *a Gaſpar* Iſland ſeen from the Stern Gallery..... N. 19° E.
The *Eaſt* Point of *Banca* breaking away into trees ..... N. 22½° W.
The north-eaſt point of the Peninſula of SEL..... S. 9° W.
The extremes of an Iſland in the Bay (which extreme is in one, with a remarkable hummock upon *Banca)* from .. S. 50° W. to S. 62° W.
The extremes of *Paſſage* Iſland ..... from .. W. 42° E. to S. 79° E.
" which laſt extreme (that of the 8 W) is in one with a ſmall round iſland a long way off, and is " the only land we ſee to the eaſtward of *Paſſage* Iſland.

" At this time, viz. 11 o'clock, the ſhip is nearly mid-channel betwixt the iſland in the Bay, " and *Paſſage* Iſſand, rather nearer to the former, in 15 fathoms water." *(See Wilſon*'s Journal, page 26.)

ſouthernmoſt

ſouthernmoſt bore from him ſouth 56° eaſt *. This linear direction from the point where the SOLIDE lay at anchor, paſſes through the middle of SADDLE Iſland, which is, in fact, the ſouthernmoſt of the iſlands.

It is from theſe linear directions combined with the bearings of WILSON's Stations *c* and *d* (farther back, pages 384 and 393) and with thoſe of COOPER's Stations IV, V, and VI (page 394) that I have placed on my chart the four weſtern iſlands of the ſouth-eaſt group, SANDY-BEACH, SADDLE FLAT, and BUTTON Iſlands: and the poſitions which I aſſign to them are confirmed by bearings taken from on board the SULIVAN which, being in a poſition whence the weſt coaſt of MIDDLE Iſland bore from her from ſouth 65° eaſt to north 45° eaſt, had an iſland (this is SANDY-BEACH) bearing ſouth 45° eaſt; another (this is SADDLE ISLAND in its higheſt part, as the hummocks on the north ſide) ſouth 51° eaſt; and a third (this is BUTTON Iſland) ſouth 55° eaſt †: in her poſition FLAT Iſland was concealed from her by BUTTON; and, indeed, he makes mention only of *three* iſlands which he perceived and ſet. If the SULIVAN's poſition at the time of theſe bearings be pricked off on my

* *See* page 104 of this volume.

† See the *Sulivan*'s Journal, in the Appendix to *Memoir of Chart of Sunda and Banca*, publiſhed by Mr. *Dalrymple*, page 18.

According to the Journal, the diſtance of the ſhip from *Middle* Iſland was about *four miles*; but it is evident that this diſtance was eſtimated too great, and cannot be, as it is ſeen on my Chart, but about *a mile and a half*; and, if it had been 4 miles, the *Sulivan* which, from the point of her bearings, ſteered, according to her logbook, (page 17 of her journal) S. ½ E.—S by E.—S by W. and ran from ½ paſt 5 to 9 P. M. upwards of 6 miles on theſe courſes, would have paſſed over the breakers and the ſhoal of the north-eaſt point of the Peninſula. It appears that *G. Robertſon* thought, like me, that there was an error reſpecting the diſtance eſtimated by the *Sulivan*; for, on his Chart and on his large Plan, he makes his ſhip's track paſs at about *two miles*, and not at *four miles*' diſtance from the *ſouth-weſt* Point of *Middle* Iſland which bore from the *Sulivan* ſouth 65° eaſt, at the ſame time that the north extreme bore north 45° eaſt. But the relative poſition of theſe two Points, ſuch as it has reſulted from the ſequel of my labour, allows me not to give more than the diſtance of a *mile and a half*, from the point where the *Sulivan*'s bearings were taken to the ſouth-weſt Point of *Middle* Iſland.

chart, it will be found that the three iſlands which I have deſignated, the only iſlands that could be perceived from her, fall very exactly in the linear directions in which ſhe ſaw them.

In regulating on my chart the poſition of the weſt iſlands of the ſouth-eaſt group according to what has been eſtabliſhed above, the width of the paſſage between theſe iſlands and MIDDLE Iſland, meaſured at the narroweſt place is 4.1 miles; and the bearing of the two Points at the ſhorteſt diſtance from MIDDLE Iſland on the one hand, and, on the other, from SANDY-BEACH is ſouth 28° eaſt, and north 28° weſt. If theſe reſults be compared with thoſe of page 393, it will be ſeen that the diſtance comes near to that of WILSON, $3\frac{2}{3}$ miles, and that the angle of bearing is nearly that of ROBERTSON's Plan, (1788) 28 degrees and a half.

I have quoted my authorities, the journals whence I have taken the data on which my chart is grounded; I have detailed the operations by which I have ſucceeded in fixing the width of the paſſage at $4\frac{1}{10}$ miles, and the bearings of the neareſt points, at an angle of 28° from ſouth to eaſt and 28° from north to weſt: I leave to the intelligent reader to aſcertain whether the uſe which I have made of the data, has led me to an exact reſult, and whether the new chart deſerves in this reſpect a preference to the older charts.

In order to place NORTH or THWART THE WAY, SOUTH, and TABLE Iſlands, compoſing the little eaſtern group which, with that of the four weſtern iſlands, form the paſſage through which paſſed the VANSITTART and the fleet under the command of Captain CLEMENTS, I have made uſe of COOPER's bearings at his Stations IV and VI (farther back, page 394). The relative poſition which the two groups take between them, according to theſe bearings, is confirmed by that which Captain CHANAL took on the 23rd

of

of December at ſeven minutes paſt nine o'clock *; from the point where the SOLIDE was at this period, the ſmall iſlands, ſeven in number, partly ſhut in by each other, formed a group, the general direction of which was north 43° eaſt.

If, on my chart a line be drawn from the ſouth point of SADDLE ISLAND, the ſouthernmoſt of the ſeven iſlands, to the middle of NORTH ISLAND, the northernmoſt, this line will have the direction of north 43° eaſt. Thus it may be concluded that SADDLE and FLAT Iſlands on the one hand, and on the other, NORTH and SOUTH Iſlands, which form the VANSITTART's Paſſage, are well ſituated on my chart, with reſpect to their relative bearing. As to their diſtance, which is the width of the paſſage, it is there ſuch as it is given by the croſs bearings of Captain COOPER's Stations IV and VI, taken to the ſouthward and to the northward of theſe iſlands.

This diſtance, at the narroweſt part of the paſſage, between the north-eaſt Point of FLAT Iſland and the ſouth-weſt Point of SOUTH Iſland, is, on my Chart, $2\frac{6}{10}$ miles; and the bearing of the two Points, in regard to each other, is eaſt 15° north and weſt 15° ſouth.

On ROBERTSON's chart, the diſtance is $4\frac{3}{4}$ miles and the angle 17°; and, on his great Plan, the diſtance is $4\frac{1}{3}$ miles and the angle 16°.

The compariſon with the other charts would be uſeleſs; the navigators who conſtructed them took not their route through this Paſſage.

After having placed the ſeven iſlands of the ſouth-eaſt Groups, as well in

* *See* page 105 of this volume.

 their

their positions relative to each other, as in their situation in regard to MIDDLE Island, it remains for me to fix the position of a *Shoal* which may be called the VANSITTART's Shoal, and which merits all the attention of navigators who may be desirous of passing through CLEMENTS' STRAIT between the seven islands, leaving, like him, three of them to the eastward, and four to the westward. This Shoal is situated to the northward of our FLAT Island, ROBERTSON's SADDLE Island. Captain CLEMENTS, who had anchored with his fleet at a little distance to the south by west of the Shoal, sent his boat to take the bearings of the islands from the Shoal itself, on which there was not found more than a foot and a half of water. These bearings make part of the sailing directions which Mr. DALRYMPLE has engraved on the Plan itself of CLEMENTS' Strait drawn by ROBERTSON, which he inserted, in 1786, in his great Collection of Plans of the Seas of ASIA, before ROBERTSON had published his general Chart and his particular Plan of GASPAR's and CLEMENTS' Straits.

From the shoal, the VANSITTART's boat set NORTH Island or THWART THE WAY, east by north, at $3\frac{1}{2}$ or 4 miles, distance estimated by the eye—ROBERTSON's SADDLE Island, which is COOPER's FLAT Island, and the same on my Chart, south by west half west $3\frac{1}{2}$ or 4 miles distant—BARN Island, which is COOPER's BUTTON Island, and the same on my Chart, west by south—The south Point of MIDDLE Island west-north-west.

ROBERTSON has subjected with tolerable exactness the VANSITTART's Shoal to the distances estimated by the eye; namely, to $3\frac{1}{2}$ miles from NORTH Island, and to $3\frac{1}{2}$ miles from FLAT Island: he has also placed it in its bearing with respect to the south Point of MIDDLE Island, that is to say, to the east 22° 30′ south from this Point; but he has given up the bearings which were taken of three of the small islands; he has placed the shoal west

of

of NORTH Iſland, inſtead of weſt 11° 15′ ſouth—north 20° eaſt of FLAT Iſland, inſtead of 14° 15′ eaſt—eaſt of BUTTON Iſland, inſtead of eaſt 11° 15′ ſouth. I am ignorant what motive can have determined ROBERTSON to give to diſtances of ſmall iſlands, *eſtimated by the eye*, and conſequently, ſo erroneous, eſpecially when the obſerver is placed in a boat near the level of the ſea, the preference to angles of bearing meaſured with care, which always afford more certainty as to correctneſs, eſpecially when the magnetic needle has no variation. I could not adopt his proceeding, and I have ſubjected the VANSITTART's Shoal to all the bearings taken, from the ſhoal itſelf, with reſpect to the ſouth Point of MIDDLE Iſland, NORTH Iſland, FLAT Iſland, and BUTTON Iſland: the point where theſe four lines of bearing met, has fallen $2\frac{7}{10}$ miles from NORTH Iſland, inſtead of $3\frac{1}{2}$ or 4 miles, mentioned in the note engraved on the Plan publiſhed by Mr. DALRYMPLE; and $1\frac{8}{10}$ miles, inſtead of $3\frac{1}{2}$ or 4 miles, from FLAT Iſland. My diſtance to the firſt iſland differs from the diſtance indicated in the Note, only in the proportion of 11 to 14; but the diſtance to the ſecond differs in the proportion of 18 to 35. I obſerve that, to reduce theſe diſtances to thoſe which were *eſtimated* from the boat that took the bearings, it would be neceſſary, either to alter conſiderably the *obſerved* bearings which do not, like diſtances eſtimated by the eye, depend on a computation always arbitrary and very uncertain, or give to the ſmall iſlands poſitions relative to each other and with reſpect to MIDDLE Iſland, very different from thoſe which it is impoſſible not to aſſign to them according to the Bearings of WILSON, COOPER, and CHANAL, which, in general, reciprocally ſerve each other as a verification and a proof.

I know of no other than ROBERTSON's Chart and Plan that preſent the eaſt part of CLEMENTS' STRAIT, that is to ſay, the weſt coaſt of BILLITON, and the ſmall neighbouring iſlands, and which can be employed

for delineating this part. But, in making uſe of the work of that navigator, I was obliged to ſubject this portion of it as well to the poſition which I have given to MIDDLE Iſland, as to that aſſumed by the ſeven iſlands which compoſe the ſouth-eaſt Groups.

I obſerve firſt that ROBERTSON anchored to the ſouth-weſt, at the diſtance of about 8 miles from the north-weſt Point of BILLITON Iſland; and that, from this Point, to abreaſt of MIDDLE Iſland and within ſight of NORTH Iſland or THWART THE WAY, he made a direct courſe of about 8 leagues: and it is, no doubt, partly from the reſult of this courſe, and the bearings which muſt have been taken of its two extreme points, that he has laid down NORTH Iſland 26⅓ minutes more to the ſouthward than the north-weſt Point of BILLITON.

NORTH Iſland, at its middle, according to the reſult of the triangles of which I have made uſe for conſtructing my Chart, is ſituated in latitude 2° 53′ 20″ (the Peak of GASPAR being in 2° 21′): and ſince the north-weſt point of BILLITON is leſs ſoutherly by 26⅓ minutes than NORTH Iſland, and ſince its latitude is ſouth, this point muſt be in 2° 27′ 10″: and it is thus that I have laid it down on my Chart. On that of ROBERTSON it is in 2° 37′; and its poſition in latitude differs on our charts 9 minutes and 50 ſeconds.

This difference, which is the ſame, within leſs than 1 minute, as that which we have had in our latitudes of GASPAR Iſland (between 2° 21′ and 2° 30′ farther back, page 353), may make us preſume that, from his anchoring-birth under the north-weſt point of BILLITON, ROBERTSON had ſight of GASPAR*;

* *Robertſon* anchored to the ſouth-weſt of the north-weſt Point of *Billiton*, at the diſtance of about 8 miles: from this anchorage, he could perceive *Gaſpar* Iſland 8 or 9 leagues diſtant, as *Wilſon* perceived it at this diſtance, from his ſtation at 11 A. M. in *Gaſpar*'s *Strait* (farther back, page 398 note *).

and

and that, not having obſerved the latitude of the anchorage, he ſubjected it to that which he applied to GASPAR. What confirms me in this opinion is, that having, by a ſeries of triangles, ſubjected in my work the latitude of NORTH Iſland to that of GASPAR, I found that their difference of latitude was 32′ 30″; and, on ROBERTSON's Chart, this difference is 33′ 30″, that is to ſay, the ſame within a minute.

In giving to NORTH and SOUTH Iſlands the poſition, with reſpect to MIDDLE Iſland, which reſulted from the ſeries of our triangles, and which differs from that given them by ROBERTSON, I was forced to bring nearer to the ſouth-eaſt group the points of the anchorage where the VANSITTART's anchor is marked off MIDDLE Iſland; and this was the ſole method of preſerving to theſe points their poſition in regard to this iſland, the extremes of which muſt have been ſet from each anchoring-place.

LONG ISLAND, that large iſland ſituated to the north-eaſt of the Groups, as well as the Points of the coaſt of BILLITON which correſpond thereto, muſt, for the ſame reaſon, have experienced a general movement towards the ſouth, in order to preſerve to them, with reſpect to MIDDLE Iſland, the poſition which ROBERTSON has given them.

XIV. ILE DE LA RECONNOISSANCE, SHOAL-WATER ISLAND, and the ſhoals ſituated to the ſouthward of the STRAITS.

I have fixed with all the exactneſs that the materials at my diſpoſal would admit of, the northern part of the Straits, and principally GASPAR Iſland and the EAST Point of BANCA, which ſerve as a land-mark for ſhips that are coming to the STRAITS from the northward; it remains to fix the land-marks for thoſe coming to them from the ſouthward.

The

The Iſland or rather the Iſlands of LA RECONNOISSANCE *, which Captain CLEMENTS calls SHOAL-WATER Iſland, is the firſt point which it is proper to determine, becauſe it is that which muſt be made by ſhips coming from the ſouthward, whether it be intended to enter by the EAST or the WEST PASSAGE.

DORDELIN, in going to CHINA, in 1784, got ſight of theſe iſlands in the morning, and, in reducing, by the computation of his run, their poſition to the latitude which he obſerved at noon, he made the latitude of the ſouthern iſland 3° 18′ ſouth.

WILSON's chart places the ſouth point of this iſland in 3° 16′ †, but he determined its poſition only by a bearing taken from his ſtation *d*, as far off as he could diſcern it: and we can only make uſe of this linear direction for ſubjecting this iſland to the ſouth Point of MIDDLE Iſland, by preſerving to it its latitude of 3° 18′, confirmed, as will be ſeen, by the Plan which was conſtructed by ROBERTSON, at the time of the diſcovery of the Eaſt PASSAGE by CLEMENTS.

This Plan, ſuch as he himſelf publiſhed it in 1788, has no ſcale of latitude, but the difference of latitude between the middle of GASPAR Iſland and the ſouth part of SHOAL-WATER Iſland or Iſlands, is there 57 miles, or 57 minutes; and if GASPAR is in latitude 2° 21′, SHOAL-WATER muſt be, according to this Plan, in 3° 18′.

* All the Charts and Plans agree in making of them two ſmall iſlands, on a N.E. and S.W. line, about 1 or 2 miles diſtant from each other, and connected by a circular ſhoal.

† I obſerve that, on this chart, the latitude of *Gaſpar* is only 2° 20′; and that as *Shoal-water* muſt have been ſubjected to *Gaſpar* by *Wilſon*'s ſeries of bearings and trigonometrical operations, it muſt have been placed 1 minute leſs ſoutherly, than if, as I have placed it, *Gaſpar* is laid down in latitude 2° 21′.

It

It is true that ROBERTSON, on his *Chart of the Straits of* BANCA, GASPAR and CLEMENTS, 1788, and on his large *Chart of the China Sea* 1791, places SHOAL-WATER Iſland in 3° 27′, that is to ſay, 9 minutes more to the ſouthward than DORDELIN; but, on theſe very charts, he places GASPAR in 2° 30′, in lieu of 2° 21′, that is, 9 minutes more to the ſouthward than the latitude which, it appeared to me, ought to be adopted for GASPAR Iſland (farther back, page 355): the difference of latitude is therefore the ſame on the two charts. As all the Charts and Plans agree in general, reſpecting this difference of 57 minutes *, it appears that it ought to be admitted; and on adding it to the 2° 21′ of GASPAR, we ſhall have for SHOAL-WATER, 3° 18′, as DORDELIN made it from his obſervation and his route.

Captain COOPER's Journal (page 19) comes to the ſupport of this determination. On the 6th of Auguſt, at noon, at the point of his firſt ſtation, his latitude obſerved was 3° 21′, and, at the ſame inſtant, the remarkable hummock on the ſouth coaſt of BANCA bore north 26° weſt—MIDDLE Iſland north 25° eaſt—and a *low iſland*, eaſt half north: from the poſition of his ſhip, and the direction in which this iſland bore, it could be no other than SHOAL-WATER Iſland: but ſince it bore eaſt half north, it is therefore *leſs to the ſouthward* than the ſhip; its latitude is therefore under 3° 21′, and conſequently nearer to 3° 18′, the latitude aſſigned by DORDELIN to the Iſland of LA RECONNOISSANCE, than 3° 27′, the latitude given by ROBERTSON.

I take the opportunity of obſerving that, if the difference of latitude be-

* *Robertſon*'s Plan, publiſhed by *Dalrymple*, as far back as the year 1786, in his Collection, gives this difference of latitude ſmaller by 2 minutes: but as this Plan is, no doubt, only a copy of that of *Robertſon* who drew it, to whatever confidence a Plan publiſhed by *Mr. Dalrymple* may be entitled, ſtill more muſt be due to the original.

tween

tween SHOAL-WATER and GASPAR is, in fact, 57 minutes, as all the charts have made it, and if the latitude of 3° 19′ or 20′, such as it is deduced from COOPER's observation and bearing in regard to SHOAL-WATER Island, is exact, GASPAR Island must be in 2° 22′ or 23′; which is far enough from 2° 30′, adopted by ROBERTSON, and near enough to 2° 21′, given by the SOLIDE's observation, taken on the very parallel of GASPAR.

ROBERTSON's two Charts and Plan, which I have quoted, agree in placing, very nearly to the southward of SHOAL-WATER Island, two shoals, under the name of *Breakers*; and the southernmost extremity is there at the distance of 11 miles from the south extreme of these islands. It is written on the Plans that a small portion of the latter is dry, that it appears white, and is very low. I have thought it proper to preserve these shoals in the position that is given to them on the Charts and Plans which the English have published within these four years, and which merit the confidence of navigators.

DORDELIN's chart indicates a third shoal to the west 33° south, and at 18 miles' distance from the Islands of LA RECONNOISSANCE (SHOAL-WATER Island). He anchored 11 or 12 miles to the south-west by west of this shoal, in 10½ fathoms; and it appears that he examined it well; for on his chart is written the following phrase:

" Sand-bank and rocks even with the water's edge, seen by the ship TRITON bound to CHINA in 1784, near which were found 7 fathoms water. It must be covered at high water. This bank is laid down on the charts of D'APRÈS' old *Neptune Oriental*. But it is not laid down on those of the new edition."

As this shoal, on DORDELIN's chart, is 7½ miles more to the southward, and

and upwards of 16 miles to the weſtward than the ſouth part of the Iſlands of La Reconnoissance (Shoal-water Iſland), or about 17 *miles to* the *weſt-ſouth-weſt half weſt* of theſe iſlands, while the ſouthernmoſt part of the Breakers which are ſeen on Robertson's Charts, is carried 11 *miles* directly to the *ſouthward* of theſe ſame iſlands, of which Dordelin had got ſight, and determined the latitude; it does not appear that we ought to confound theſe ſhoals, and ſuppoſe that Dordelin's Shoal and the Breakers marked on Robertson's charts, are but one and the ſame ſhoal: I have therefore preſerved and laid down both on my chart; it will there be ſeen that in placing them in the reſpective poſition which has been given to them, the one on the French Chart, the others on the Engliſh Charts, the track of Captain Clements, borrowed from Robertson's Chart, paſſes in mid-channel, between the two poſitions, at $6\frac{1}{2}$ miles diſtance from both: and, at this diſtance, Dordelin's Shoal, *that ſand-bank and rocks even with the water's edge, which muſt be covered at high water*, could not be perceived by Clements, as Robertson's *Breakers* of which *a ſmall portion* only becomes dry and *is very low*, could not be perceived by Dordelin, ſince having paſſed to the weſtward of his ſhoal, and thence ſteered to the north-eaſt, he came no nearer than 9 miles to Shoal-water Iſland, and he muſt have paſſed at a greater diſtance from the *Breakers* which extend 11 miles to the ſouthward of theſe iſlands. Cooper's track, drawn according to his bearings and his chart, paſſes not at more than the diſtance of a mile to the weſtward of Dordelin's Shoal: but if, as we muſt believe from the report of this captain, his Shoal is not dry at low water, Cooper may have paſſed very cloſe to it without getting ſight of it.

I here terminate the Analyſis, too long perhaps, of the Charts which I have conſtructed of the two Straits compriſed in the great Strait Between Banca and Billiton; in taking the liberty to make corrections in thoſe which

which have, within theſe few years, been publiſhed by the navigators who have frequented this STRAIT, it was incumbent on me to enter minutely into the motives of the alterations; and I muſt expect from time and experience to learn whether my labour has led me to reſults, the correctneſs of which is ſufficient for the ſafety of navigation.

I have thought that it might be uſeful to French navigators, who do not poſſeſs the Plans of the Engliſh, and that it would be agreeable to them to ſee marked on the Charts of the STRAIT all the tracks of the ſhips which, till 1791, have frequented the two Paſſages: the traveller loves to ſee a beaten path: he is then certain of not loſing his way.

In GASPAR'S STRAIT or the WEST PASSAGE will be found *:

1ſt. DORDELIN'S track (the TRITON, the PROVENCE, and the SAGITTAIRE) going to CHINA in Auguſt 1784.

N. B. I might alſo have delineated there his track on his return, but it would be confounded with others, without being of any uſe.

2nd. The track of the SULIVAN (Captain STEPHEN WILLIAMS) coming from CHINA in December 1784, taken from his Journal.

3rd. The track of the CARNATIC (Captain LESTOCK WILSON) on her

* I have thought it proper to diſpenſe with marking the track of *Gaſpar* whoſe chart is to be found in D'APRÈS' *Neptune Oriental*, which is in the hands of all our navigators, and of which Mr. *Dalrymple* has given a copy in his *Collection*. This track preſents nothing particular, and *Gaſpar*'s Chart on which it is marked is ſo defective, that it would not be poſſible to delineate his track on a more correct chart.

return

return from CHINA in February 1787, ſubjected to the Bearings mentioned in his Journal.

4th. The track of the WARREN HASTINGS (Captain JOHN PASCAR LARKINS) coming from the northward in May 1788, ſubjected to his Bearings and his log-book.

5th. Laſtly, the track of the SOLIDE (Captain ETIENNE MARCHAND) on her return from CHINA, in December 1791, drawn from the Bearings mentioned in the ACCOUNT of her voyage, and the Chart which was conſtructed by Captain CHANAL, conjointly with the Engineer LE BRUN.

N. B. I have not inſerted in my Chart the track of the MACCLESFIELD Galley, coming from CHINA, in March 1702, which ROBERTSON has drawn on his large Plan: it preſents nothing particular, and would only crowd the Paſſage. From the parallel of the EAST Point of BANCA, and $2\frac{1}{4}$ miles from this Point, this Track runs ſouth and ſouth by eaſt, and ſtops at the parallel of the SOUTH-EAST Point of the Peninſula of SEL at the diſtance of $2\frac{1}{2}$ miles from that Point. The depth of water is the ſame as that which is ſeen on the other tracks that paſs in mid-channel in the WEST PASSAGE. It might be preſumed that it has been marked on ROBERTSON's large Plan, only to ſhew a track made in this Paſſage, by an Engliſhman, previouſly to the publication of GASPAR's Chart by D'APRÈS *.

In

* Mr. *Dalrymple* has given us in his Collection of *Memoirs (Appendix to Memoir of Chart of Sunda and Banca*, page 1 to 10), an Extract from the Journal of the *Macclesfield Galley*, which in coming from the northward, in March 1702, paſſed unintentionally through *Gaſpar*'s Strait: no

In the EAST PASSAGE or CLEMENTS' STRAIT will be found:

1ſt. The track of the VANSITTART and the Fleet commanded by Captain JOHN CLEMENTS, coming from CHINA, in the beginning of JULY 1781, delineated from the Plan drawn and publiſhed by GEORGE ROBERTSON:

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no help can be derived from it for drawing the Plan of the Strait: but it appears that ſhe is the firſt veſſel known that chance has led to paſs it.

After having been long doubtful reſpecting the land in ſight of which he found himſelf, the Captain diſcovered that it muſt be the Iſland of *Banca*.

"Yeſterday (the 13th of March)" it is ſaid in the Journal, "ſteering along the coaſt of "*Banca*, we found it altogether as good as the *Plaiet* ſheweth; the ſoundings as per Collumn; "there is many ſmall Iſlands near the ſhoar, from which we ſaw many Breakers, and from the "ſhoar itſelf, but they are all ſo near and viſible that none have any occaſion to come ſo near. Laſt "night in the evening at 6 we got under the north Point of the Eaſt end of *Banca* anchored in "18 fathom, in the night it was calm; we found a ſmall current along the ſhoar to leeward, "the Iſland N. E. from this point or thereabouts diſt. 7 leagues is very remarkable." (Mr. *Dalrymple* judges that this muſt be *Gaſpar* Iſland, becauſe in the original manuſcript, is drawn a *Peaked Hummock*.) "In the morning at day-light weighed and ſent our pinnace on head of the "ſhip to ſound, and the yawle I ſent towards *Banca* into the Bay, being inclined to have bor-"rowed on that ſide, but going right in ſhe ſoon ſhoaled the water to 10 fathom. I ordered them "on or towards the great Iſland," (This muſt be *Middle* or *Paſſage* Iſland) "and reſolved to keep "the middle: ſteered through S. by E. $\frac{1}{2}$ E. had not leſs than 13 fathom nor more than 18 till "the eaſt part of the Great Iſland bore E. by S. and the South Point of *Banka* S. by W. then 24, "26 fathom; ſoon after ſhoaled down to 12, 11$\frac{1}{2}$, &c."

"I conclude that the South Part of *Banka* is on the latitude of 3° 2′ ſouth." (This latitude can agree only to the ſouth-eaſt Point of the Peninſula, and not to the ſouthernmoſt Point of *Banca*).

"On the 15th, at 6 in the evening, the ſouthermoſt part of the *Great Iſlands* bore S. E. and the "*ſouthmoſt* part of *Banca* in ſight, N. W. by W. diſt. 5 or 6 leagues; the ſhip drove to the "eaſtward with the current a ſmall matter." We are at a loſs to conceive how a ſhip that has the *ſouthernmoſt* part of *Banca north-weſt by weſt* 5 or 6 leagues diſtant, can have the *Great Iſland ſouth-eaſt*.

The Captain of the *Macclesfield* terminates this article of his Journal by ſaying: "I like the "coming through this way much better than through the Straits of *Banca*, it's more ſecure "and much nearer."

2nd.

2nd. The track of the ATLAS (Captain ALLEN COOPER) going to CHINA, having entered the Strait from the ſouthward, in Auguſt 1785; it is drawn from his Journal:

3rd. The track of the ROYAL ADMIRAL, taken from ROBERTSON's large Plan, where it appears without a date, and without any other indication.

Independently of theſe eight tracks which are marked at full length on my chart, I have alſo inſerted there, from the Journals, thoſe of the HAWK (Captain ROBERT RIVINGTON) and of the PONSBORNE (Captain WILLIAM HAMMETT) ſailing in company, and coming from the northward in January 1785. I have diſcontinued theſe laſt-mentioned tracks above the parallel of GASPAR Iſland: to trace them beyond that, would create confuſion in the Paſſage between GASPAR and TREE Iſland, by which theſe two ſhips entered the Strait. Theſe two tracks have appeared to me uſeful to be preſerved, becauſe they may indicate the places that are *clean* amidſt the ſhoals ſituated from the north to weſt-north-weſt, in regard to GASPAR Iſland.

This ſame reaſon has determined me to mark the track of the MASCARIN (Captain CROZET) in 1773, ſuch as it is ſeen on the Chart N° 49, 2d. of D'APRÈ's *Neptune Oriental*, 2nd edition, a copy of which Mr. DALRYMPLE has given in his *Collection* of Plans. This track of CROZET croſſes the part of the ſea ſituated to the northward of the two Straits, and paſſes very cloſe to the Northern Shoals which this navigator has made known, it likewiſe paſſes between the four Breakers north of BANCA, which were ſeen by the MACCLESFIELD, in 1702, and the SULIVAN, in 1784, and between which the SOLIDE paſſed in 1791.

Although VIEWS of LAND are, in general, of no great uſe to navigators, becauſe

becauſe they neceſſarily vary, and often in ſuch a manner as to be incognizable according to the different points from which the lands may be ſeen; yet that I may neglect nothing that can add any advantage to the general Chart which I publiſh of the STRAIT BETWEEN BANCA AND BILLITON, I have cauſed to be engraved a VIEW, drawn by the Engineer LE BRUN, of the northern Part of BANCA, which comprehends the Mountain ſerving as a land-mark, ſuch as, in the poſition indicated, this part preſents itſelf to ſhips coming from the northward; various views of GASPAR Iſland taken from different Points; laſtly, a GENERAL VIEW of the ſouthern lands of the STRAIT, ſuch as they appeared to DORDELIN, in ſtanding for the Paſſages when coming from the ſouthward.

N. B. The figures of the *ſoundings* indicate, on the tracks of the Engliſh, *fathoms* of 6 ENGLISH feet: to convert the *fathoms* into *Braſſes* (fathoms) of 5 FRENCH feet, it is ſufficient, in practice, to add an *Eighth* to the quantity of the Engliſh ſoundings. If I had wiſhed to make this reduction on the Chart itſelf, I ſhould have been obliged to employ fractional quantities at the end of the whole ones; and this multitude of figures, crowded and heaped together, would not have failed to cauſe a great confuſion in the ſoundings, and to crowd the Plan which was already but too much ſo.

After having thus analyzed the materials of which I have made uſe for conſtructing a general Chart of the Strait BETWEEN BANCA AND BILLITON, by appropriating to its execution the Bearings and the Obſervations of the navigators who, till 1791, have publiſhed the Journals and Plans which brought us acquainted with the two Paſſages, it remains for me to unite in a general point of view the particular remarks which each of them has made on the depth of water and the quality of the bottom in the channel, on the iſlands, the points of land, the ſhoals, &c. which are met with in the Strait, or which

which lie to the northward or ſouthward of it, and to mention the *Sailing Directions* relative to both PASSAGES, for which we are indebted to their experience, and which their zeal for Navigation has induced them to publiſh. I have thought it the more neceſſary to preſent them at ſome length, as this Strait being little known when D'APRÈS publiſhed his directions reſpecting the navigation of the SEAS OF ASIA, and French navigators being ſcarcely acquainted with any other work than his, it was requiſite to ſupply what is deficient in this particular in the directions to which, in other reſpects, they have every reaſon to conform themſelves in order to regulate the routes that they have to follow according to the ſeaſon, if they wiſh to repair with ſafety and diſpatch, from one place to another.

1. *GENERAL Remarks on making the land, in coming to the Straits from the northward; and on the navigation in GASPAR's Strait, or the WEST PASSAGE*.*

" I would adviſe every ſhip intending to come out of the CHINA Sea by GASPAR's Strait" ſays Captain LARKINS, page 2 of his Journal, " to make " PULO-TOTI (a ſmall iſland ſituated 0° 53′ ſouth latitude, and at 45 miles " diſtance to the north 17° eaſt of Point PESANT, the moſt northern of the " Iſland of BANCA†): and from thence to ſteer a courſe midway between " GASPAR Iſland, and the EAST Point of BANCA."

* I refer the reader to the *Narrative* of *Marchand*'s voyage for the track which the SOLIDE followed in her paſſage through the *Strait:* he will there find the beſt directions that can be given to ſhips which intend to paſs *Gaſpar*'s Strait in coming from the northward, pages 97 to 106 of this volume.

† On the Chart of the Straits of *Banca*, *Gaſpar*, and *Clements*, publiſhed in 1788, by *G. Robertſon*, it is ſaid that the hill which riſes above Point *Peſant*, is ſeen from *Pulo-Toti*, and from *Pulo-Decan*, ſituated about 10 miles to the ſouth-weſt by weſt and weſt-ſouth-weſt of *Toti*. This, doubtleſs, implies very clear weather: the diſtance from coaſt to coaſt is 15 leagues, on *Robertſon*'s chart, and 16 or 17 leagues, if the diſtance be meaſured to the ſummit of the hill, and it ſeems to me that in general, it is reckoned that Point *Peſant* can be ſeen only 8 or 10 leagues.

But

But Mr. DALRYMPLE thinks otherwiſe; and it is well known of what weight is his opinion.

" Ships intending to paſs to the EASTWARD of GASPAR," ſays he in a note, " cannot, at any time, but eſpecially *late* in the *Seaſon*, when the ſouth-" eaſt winds may be expected to prevail, have occaſion to go round to *lee-*" *ward* by PULO-TOTI. It is proper, indeed, to have daylight for making " GASPAR, and ſhips ſhould not approach it till they are in the fair-way " between *It* and BANCA; I mean in the preſent ignorance of the exact po-" ſition and extent of the *Shoals* on the *weſt* and *north-weſt* of GASPAR."

According to Captain WILSON, " GASPAR Iſland bears from PULO-TOTI " ſouth-eaſt exactly, diſtance 42 leagues," (On ROBERTSON's chart, the diſtance is only 40 leagues, and the bearing ſouth-eaſt 3° ſouth), " for which," continues WILSON, " you may ſteer almoſt direct upon leaving PULO-TOTI; " the ſoundings are more regular, and it ſeems adviſable not to approach " BANCA nearer than 17 or 16 fathoms." (WILSON's *Journal*, page 35.)

With this precaution, you will avoid getting entangled among the breakers ſituated to the northward of BANCA, which, however, are by no means dangerous, ſince they all ſhew themselves (more or leſs, no doubt, according to the time of tide), and ſince the MASCARIN and the SOLIDE paſſed between the four breakers: for greater ſafety, it is expedient to go to the eaſtward of all theſe ſhoals.

But as soon as you get ſight of GASPAR, you ought, as Mr. DALRYMPLE adviſes, to ſteer ſo as to get into mid-channel between that iſland and the EAST point of BANCA.

"Steering for mid-channel," ſays WILSON, *ibid.* "betwixt GASPAR "Iſland and the EAST Point of BANCA, you may paſs (as he did) TREE Iſland, "within a mile or nearer, to the weſtward of *It*, and then the winds or cur-"rents, prevailing at this ſeaſon (WILSON was in the ſtrait on the 26th of "February), will incline you to borrow upon BANCA; but you muſt avoid "entering the Bay, which is formed by the eaſt and ſouth-eaſt Points, (or the "Gulf formed between the EAST Point of BANCA and the north-eaſt Point "of the peninſula of SEL): and having paſſed the eaſt point, you muſt not "bring it to the northward of north north-weſt half weſt*; the ſoundings "betwixt theſe two points are the beſt guide; you may range betwixt them in "14 and 15 fathoms water very regular depths, till the iſland, in the Bay, "bears weſt of you, and then you will ſee the reef, which runs off the ſouth "eaſt point a mile and a half at leaſt. You muſt edge over to the eaſtward, "ſo as to paſs without the reef, and having brought the SOUTH-WEST Point "of PASSAGE Iſland to bear north of you, you may ſteer to the ſouthward, "not bringing it to bear further to the eaſtward than north by eaſt, while it "continues in ſight."

* Captain *Wilſon* being nearly abreaſt of the *Eaſt* point of *Banca*, ſays that "ſeeing nothing "like danger, and having ſuch regular ſoundings, hauled in S S W, S W, and S W by W, wiſh-"ing to borrow upon *Banca*, the weather ſhore to anchor.

"At $\frac{3}{4}$ paſt 6, while preparing to anchor, ſhoaled in a caſt of the deep ſea-line, from 20 to $18\frac{1}{2}$ fathoms, next caſt to $15\frac{1}{2}$, anchored immediately, and when the ſhip was brought up, found only $8\frac{1}{2}$ fathoms muddy bottom."

"Sent an officer to ſound round the ſhip, whoſe report is as follows."

S b E. from the ſhip $6\frac{3}{4}$ to 7 fathoms—S S E $\frac{1}{2}$ E from $8\frac{1}{2}$ to $9\frac{3}{4}$—S b E $\frac{1}{2}$ E. from 13 to 15—S b E from $7\frac{1}{2}$ to 6—S from $5\frac{1}{4}$ to 5—S $\frac{1}{2}$ W from 4 to $3\frac{1}{4}$—S b W $3\frac{1}{2}$—S b W $\frac{1}{2}$ W from $3\frac{3}{4}$ to $3\frac{1}{2}$ S b W $\frac{3}{4}$ W. from 4 to $3\frac{3}{4}$—S S W $\frac{1}{2}$ W from $4\frac{1}{4}$ to $4\frac{1}{2}$—S W $\frac{1}{2}$ S from $4\frac{1}{2}$ to $4\frac{3}{4}$—S W b W 5—W S W. rowing towards the ſhip, from 5 and $5\frac{1}{2}$ to 4; then, from 4 to $7\frac{1}{2}$ all hard ſand.—A. M. Sent the boat again to the diſtance of $\frac{3}{4}$ of a mile from the ſhip. W. N. W. from her, from $7\frac{1}{2}$ to $9\frac{1}{2}$—W $\frac{1}{2}$ N. from $8\frac{1}{2}$ to $7\frac{3}{4}$ ſoft bottom—Weſt, from $7\frac{1}{2}$ to 7 hard ſand—Rowing to the ſouthward he found the ſoundings as over night, and S b E $\frac{1}{2}$ E. from the ſhip he found 13, 14, 15. and 16 fathoms deepening faſt to the eaſtward. See *Wilſon*'s Journal, pages 24 and 20.

Captain WILSON, other navigators, and latterly Captain MARCHAND, have experienced that, when a ſhip is out of the ſtrait, but has not yet paſſed the parallel of the SOUTH-EAST Point of the peninſula (of SEL) the currents ſet to the ſouth-eaſt, at the rate of about a mile an hour; but this rate, and even the direction of the current, muſt experience ſome variations according to the time of tide.

2. *Breakers to the northward of the Northern Coaſt of BANCA.*

I have before mentioned (pages 349 to 352) every thing that can indicate the poſition of theſe breakers and their diſtances and reſpective bearings, as well from each other as with reſpect to the ſmall iſlands which are cloſer in ſhore, and to Point BRISÉE of BANCA. According to the report of Captain CHANAL, theſe Breakers are above water; but it may happen that at certain times of tide, and eſpecially at the times of the equinoctial ſpring tides, they do not ſhew themſelves at high water. Captain STEPHEN WILLIAMS of the ſhip SULIVAN, who ſaw and ſet three of theſe Breakers (farther back, page 351, note †), ſays, in his Journal, that "on the breakers there appeared "*two* or *three rocks* above water." I would not, continues he, "adviſe any "one that ſails along the *north coaſt* of BANCA to come under 15 or 16 "fathoms water, then they will have *muddy ground*, but, within that," ſays he, "I found it *hard and rocky*."

Captain CROZET, commanding the MASCARIN, who, in 1773, croſſed in the middle of the four (patches of) Breakers, from eaſt to weſt had ſoundings at 17—16—15—14—12—10—11—12, and 14 fathoms (*See* D'APRÈS' Chart, N°. 49, 2nd. Edition of the *Neptune Oriental.*) Captain MARCHAND, in the SOLIDE, who, in 1791, croſſed the four Breakers from weſt to eaſt, had 12—13—12—14—13 and 14 fathoms, a bottom of ſand, gra-

vel, and broken ſhells: he anchored in the latter ſoundings of 14 fathoms, with a bottom of the ſame quality. *See* farther back, pages 350, note *.

3. *Breakers to the north by weſt of* GASPAR *Iſland, and of the* WARREN HASTINGS's *Shoal.*

I refer the reader to what I have ſaid (farther back, paragraph IV. pages 363 to 368) reſpecting the breakers ſituated to the north-weſt by weſt of GASPAR Iſland: there may remain ſome doubt as to their true poſition, and their number, but not as to their exiſtence.

The poſition of the WARREN HASTINGS's Shoal (paragraph III. pages 358 to 363) is better determined by the Bearings which Captain LARKINS took from the point where he remained aground for three days, and from which he at the ſame time ſet GASPAR Iſland and TREE Iſland: I ſhall not here repeat what I have ſaid of the preſumed identity of this Shoal and of the Breakers which Captain STEPHEN WILLIAMS of the SULIVAN perceived at about the diſtance of 6 miles to the weſt ſouth-weſt of his ſhip, from which, at the ſame moment, he ſet GASPAR Iſland ſouth-eaſt diſtant 3 leagues, and TREE Iſland ſouth half eaſt (pages 368 to 371).

The Shoal to which I have given the name of the WARREN HASTINGS, lies, by Captain LARKINS's account, nearly north and ſouth; it is about $1\frac{1}{2}$ or 2 miles in length, but with an arm extending to the eaſtward, about the middle of the *Rock*; and it was on the extremity of this arm that the WARREN HASTINGS ſtruck (page 1 and following of his Journal.)

" Our endeavours to get the ſhip off," ſays he, " proving ineffectual be-
" fore the tide fell, I went in the cutter, and ſounded many parts of the *Shoal*,

" to the northward and weſtward of us, and had in many parts of it only 2 " fathoms, and in two places 1½ fathoms." *(Ibid.* page 1.)

" The next day," ſays Captain LARKINS, " the winds prevailing north- " erly, and not being able to attempt getting to the northward of the *Shoal,* " I went in the cutter to ſound between the Iſland (GASPAR) and the *Shoal;* " ſteering from the ſhip S. S. E. until the *Iſland* bore eaſt; then eaſt, until " the ſhip bore N. W. then N. W. on board; having the whole way had re- " gular ſoundings from 16 to 18 fathoms: from which I was ſo far convinced " there was *Channel* between them, that had the wind remained northerly, I " was determined to go, eſpecially as the HAWKE and SULIVAN had gone " that paſſage before, and by their Bearings muſt very narrowly have eſcaped " that *Rock.* A breeze ſpringing up ſoutherly, I ſounded the north end of the " ſhoal, and anchored on the BANKA *Shoar* in 18 fathoms." *(Ibid.* page 2.)

Although Captain WILSON, in the CARNATIC, did not paſs between GASPAR and TREE Iſland, but at about a mile to the weſtward of the latter, he muſt, as well as the ſhips quoted by LARKINS, have paſſed at a very little diſtance to the eaſtward of the WARREN HASTINGS's Shoal.

" After making PULO TOTI," continued Captain LARKINS, " I would " adviſe every ſhip to ſteer from thence a courſe midway between GASPAR " Iſland and the eaſt Point of BANKA, there being about 7 leagues between " them (more exactly 8 miles from coaſt to coaſt); ſhe will moſt likely ſee " them both together, I would then adviſe her to keep the EAST Point of " BANKA between ſouth by eaſt and ſouth by weſt, as, by our bearings, ſhe " will avoid the *Shoal,* on which we unfortunately ſtruck, and by the other, " the very *dangerous Rocks* on the BANKA Side. We rounded the EAST END " of BANKA between 3 and 4 miles diſtance and carried very good ſoundings.

" In

" In the evening we anchored as per log, about 3 leagues ſhort of the *nar* " *row entrance* of the *Straits* of GASPAR." (Page 4 of his Journal.)

It appears from theſe directions, that Captain LARKINS is particularly anxious to warn ſhips of the ſhoal on which he ſtruck; and he is in the right, for this ſhoal is the more dangerous as it is not viſible, and as a navigator can have no knowledge of it till his ſhip ſtrikes. But he need no longer be under any apprehenſion of it as ſoon as he has brought GASPAR to bear eaſt; for this iſland is more to the ſouthward than the Shoal; and then he ought to ſteer ſo as to paſs in mid-channel between TREE Iſland and the EAST Point of BANCA, and borrow nearer to the Rock than to the Iſland, if he perceive that the currents ſet into the gulf.

Captain STEPHEN WILLIAMS of the SULIVAN, anchored in 15 fathoms, fine ſtiff clay, GASPAR Iſland bearing ſouth-eaſt by ſouth, diſtant about 4 leagues. From this point, he ſays that he " kept ſtanding in for the Strait of " BILLITON, with GASPAR Iſland about 2 points on the larboard bow (in the " eaſt-ſouth-eaſt) had very regular ſoundings, but moſtly *rocky* ground, until " abreaſt of the iſland, when we had *mud.*" (*See* his Journal *.)

It may be remarked that this track of the SULIVAN paſſes between the WARREN HASTINGS's Shoal and GASPAR Iſland, which lie, with reſpect to each other, weſt-north-weſt and eaſt-ſouth-eaſt; and it is probable that ſhe paſſed within a very little diſtance of the ſhoal, when GASPAR bearing eaſt-ſouth-eaſt, ſhe found *rocky* ground; but having got abreaſt, or to the weſt-

* *Memoirs publiſhed by Alexander Dalrymple. Appendix to Memoir of Chart of Sunda, and Banca* page 16.

ward

ward of CASPAR, and having paſſed beyond the rocky ledge, ſhe met with a *muddy* bottom.

4. *GASPAR Iſland and the Rock to the weſtward of that Iſland.*

" GASPAR Iſland," ſays Captain WILSON, " is pretty high; covered with " trees, with a hummock in the middle, and may be ſeen 10 leagues. " There is a ſmall Rock off GASPAR Iſland, which in one with the ſouth " end of it bore eaſt by ſouth $\frac{1}{4}$ ſouth. It ſeems to be ſome diſtance off, as, " ſhut in upon the iſland, it appeared very plain, a black ſpot in the front of " it, it may probably be 3 or 4 miles off." (Page 22 of his Journal). But he ſays in another place (page 4 *ibid.*) that " the Rock off GASPAR Iſland is " laid down by its bearing from *It*; the two in one, weſt. I gueſs," adds he, " its diſtance off to be about 2 or 3 miles. It is larger than a *long-boat*, and " has ſome trees on it."

By Captain COOPER's account, GASPAR Iſland is moderately high; it ſeems to be *five miles* (two miles *) in extent from ſouth-eaſt to north-weſt; it is well wooded, with many *waterfalls* †; he ſaw no *Breakers*, but thoſe on the *Rock* weſt-north-weſt of it. (Page 24 of his Journal.)

An officer diſpatched by DORDELIN to viſit GASPAR Iſland, while he lay at

* The length indicated by *Cooper* appears much too great. Captain *Wilſon* does not fix it; but it is ſeen in his Journal, (*page* 23) that at the moment when *Tree* Iſland bore in one with the Hummock or Peak on *Gaſpar* Iſland N. 62° E. the extent of *Gaſpar*, meaſured with a ſextant, was ſeen under an angle of 8° 58′: the ſhip was then 1 mile to the weſtward of *Tree* Iſland. From another point, being 7 or 8 miles diſtance from the iſland, it bore from N. 76° E. to S. 87° E.: the iſland was then ſeen entirely under an angle of 17°. According to this latter bearing, we cannot give it more than 2 miles in length; and it would have leſs by the former.

† Thus ſays the original: yet I do not preſume that theſe are *caſcades*.

anchor

anchor in the channel between GASPAR and TREE Iſland, there diſcovered a deep cavern, full of thoſe birds' neſts which the Chineſe conſider as ſuch a dainty and for which they give a high price *.

5. *TREE ISLAND, the ROCHER NAVIRE of the French.*

Of this iſland Captain WILSON's Journal gives us a gradual deſcription that indicates the different aſpects under which it preſents itſelf to ſhips coming from the northward, in proportion as they approach it.

" At 2 P.M." ſays WILSON, " we ſaw a ſmall iſland from the maſt-head, " bearing ſouth-ſouth-eaſt, which looked like a ſhip ſailing before the wind, " and was for ſome time taken for one.

" At $\frac{1}{4}$ paſt 3, this iſland, which is a very remarkable one, having two or " three trees at the very top of it, it is formed like a dome, and is about as " high out of the water as our poop, having a ſmall rock, a cable's length " or ſo diſtant, bore ſouth-ſouth-eaſt: at the ſame time GASPAR Iſland bore " ſouth 73° 20′ eaſt.

" At $\frac{1}{2}$ paſt 4, TREE Iſland bore eaſt by ſouth diſtant 1 mile: the *Rock* off " it open to the ſouthward eaſt by ſouth $\frac{3}{4}$ ſouth.

" *Breakers* ſeem to extend about half a mile to the northward, and the

* Theſe are the neſts of the *Salangane*, a ſpecies of *alcyon*, the *ſwallow peculiar to the ſhore of* CONCHIN-CHINA. Numberleſs ſtories have been told and repeated reſpecting the nature and the properties of theſe neſts: it appears at the preſent day beyond all doubt, that this bird compoſes its neſt with the fiſh ſpawn, which, in the ſeas of *Aſia*, covers the ſurface of the water in certain times of the year.

" ſame

" ſame diſtance to the ſouthward of this *Iſland*, but beyond that diſtance the " paſſage is apparently quite clear: excepting a patch of green moſs, with " the two or three trees which are on the top of it, it is a hoary, barren, " clefted rock; the trees upon it are pretty high, ſo that it may be ſeen 5 " leagues off. (At that diſtance, as he ſays, it looks like a ſhip ſailing before " the wind). The *Rock*, which lies to the ſouth-eaſt of *It*, is about as high " out of the water as a ſhip's long-boat." (*See* WILSON's Journal, pages 21 to 23—and alſo page 4).

A ſhip coming from the northward, ſays Captain CHANAL, at firſt diſcovers the firſt iſlot of ROCHER NAVIRE (TREE Iſland), and an hour and a half after, its ſouthern iſlot. When the latter and the ſouth Point of GASPAR Iſland bore, in one, eaſt 23° north, we diſtinguiſhed from the SOLIDE a chain of *Breakers* which connect the firſt iſlot to the ſecond.

Captain COOPER, who made TREE Iſland when coming from the ſouthward, merely ſays (page 24 of his Journal) that when ſeen from that ſide, it appears like a *ſail*, and has a *large tree* on the middle: other navigators ſay a *clump of trees*.

If they do not agree as to the number of trees, they at leaſt agree as to the figure of the iſland; all the deſcriptions accord in giving it, when ſeen at a certain diſtance, the appearance of a ſhip under ſail. It ſeems to me that the name of ROCHER NAVIRE, which may be expreſſed in Engliſh by SAIL ISLAND, ought to be adopted in preference to TREE ISLAND, which in French ſignifies ILE DE L'ARBRE or ILE AUX ARBRES; for the rock will always preſerve its form of a ſhip under ſail, while the remarkable trees will fall

with age, and with them will fall the diſtinctive ſign by which it is known *.

6. *Paſſage between* Gaspar *Iſland and* Tree *Iſland (*Rocher Navire.*)*

We might conſider it as certain that the Paſſage is clear on both ſides of Tree Iſland. Captain Wilson who, as has been ſeen, paſſed to the weſtward of it at the diſtance of a mile carrying from 19 to 20 fathoms; on the other hand, Dordelin, who paſſed between Tree Iſland and Gaspar, as well outward as homeward bound, and anchored on coming out of the channel, had conſtantly 20 fathoms, whether he paſſed farther from or nearer to the one or the other. Cooper, who paſſed there when coming from the ſouthward, likewiſe had 19 or 20 fathoms; and four other ſhips known, the Royal Admiral, the Hawke, in company with the Ponsborne, and the Sulivan, found the ſame depth of water.

However, Captain Larkins tells us in his Journal (page 4) that "having "had ſome converſation on the ſubject of this paſſage with Don Juan "d'Urella, who commands the St. Louis, ſhe had been through Gaspar "Straits, ſeven times, *Twice* having paſſed to the eaſtward of Tree Iſland, "*one* of which times ſhe had ſeveral caſts of 4 fathoms, ſo that although the "Sulivan and Hawke paſſed that way without meeting with any accident, "it can by no means be an adviſable paſſage."

To this concluſion we may oppoſe, that, out of twelve known tracks in Gaspar Strait, five only paſs between Tree Iſland and the East Point of

* It appears to me the more expedient to adopt the name of *Rocher Navire*, or *Sail* Iſland, as, at no great diſtance from the Strait *Between Billiton and Banca*, in latitude 4° 50 ſouth, on the eaſt coaſt of *Sumatra*, is ſituated another *Tree* Iſland, which, on the French charts, bears the name of *Iſle aux Grand Arbres (Great Tree* Iſland.)

BANCA: and the ſeven others between GASPAR and TREE Iſland; and that none of the ſhips that have taken this laſt-mentioned paſſage found there leſs than *nineteen* fathoms. Is it not poſſible that LARKINS and URELLA might have miſunderſtood each other? that the latter may have had, as he ſaid, ſome caſts of *four* fathoms, but that he did not get them *till after he was clear of the paſſage?* and, in fact, he may have had this little depth of water, if, after having cleared the paſſage, he continued to ſteer north and north by weſt, and approached too near the ſhoals, which are ſituated in thoſe directions, for a ſhip that comes out by the channel between TREE Iſland and GASPAR. Moreover, I ſee no reaſon for preferring this narrow paſſage to the fine and wide paſſage which is open between TREE Iſland and the EAST Point of BANCA, unleſs the direction of the wind, or ſome particular circumſtance, ſhould determine a preference to be given to the former. The rather doubtful poſition of the large ſhoal on which the WARREN HASTINGS ſtruck, and the ſuſpected exiſtence of ſome others in its vicinity, muſt deter ſhips that come from the northward from taking the paſſage between GASPAR and TREE Iſland; which, beſides, ſerves only to lengthen the way to no purpoſe: and thoſe that come from the ſouthward, if they ſail out of it at the cloſe of the day, muſt be afraid of finding themſelves entangled in the night among the Breakers to the northward of GASPAR, the number and poſition of which are not yet well determined. But it was expedient to eſtabliſh as a truth, in oppoſition to the doubt ſuggeſted by Captain LARKINS from the account of Don JUAN D'URLELA, that ſhips which ſhould be obliged to paſs between GASPAR and TREE Iſland might run through there with ſafety, and that, throughout, they will find a good depth of water.

7. *The Mountain* ſerving as a land-mark on BANCA, (called by the Malays TANJONG BREKAT).

Captain WILSON appears convinced that the mountain which ſerves as a

land-mark on BANCA for ſhips coming from the northward, is "the ſame, both "from its ſhape and ſituation," he ſays, "as the one which he has called "Mount PARMASAN (or rather PARMISSANG or PERMISSANG), which is ſeen "in the STRAIT OF BANCA." (Pages 5 and 21 of his Journal).

I cannot coincide in this opinion. The two mountains are, indeed, ſituated on the ſame parallel (about 2° 36′ ſouth), at leaſt to judge of them by the latitude which the charts aſſign to the PERMISSANG of the STRAIT of BANCA, and by that which various bearings give to the remarkable mountain of GASPAR'S STRAIT; but, on conſulting the ſame charts, we ſee that the mount PERMISSANG of the STRAIT OF BANCA, ſituated to the ſouth and very near the river that bears the ſame name, is at a very little diſtance from the coaſt of the Strait: and if we admit that its ſituation is well laid down on the charts, it would be at a diſtance of upwards of *fifty* miles from the EAST point of BANCA in GASPAR'S Strait; and yet the croſs bearings of WILSON, as well as thoſe of CHANAL, give but twenty or twenty-one miles at moſt, for the diſtance from the EAST point of BANCA, to the mountain ſerving as a land-mark; there remains therefore between this mountain and Mount PERMISSANG of the STRAIT OF BANCA, a diſtance of *twenty-nine* or *thirty* miles.

Be it as it may with reſpect to this opinion of Captain WILSON, this much is certain, that he perceived the mountain of GASPAR'S STRAIT, from the parallel of 2° 3′, that is, about the diſtance of 10 leagues; and he adds that "it may be ſeen much farther off," (page 4 of his Journal). "The SOLIDE," ſays Captain CHANAL, "was at the diſtance of no more than 7 leagues "from it, and 3 or 4 leagues only from the coaſt, when he began to diſcover "the mountain from the deck." It appears that the diſtance at which it may be perceived varies conſiderably according as the weather is more or leſs clear, more or leſs hazy; for Captain COOPER in the SULIVAN ſaw the Breakers

ſituated to the northward of the northern coaſt of BANCA, and one of the ſmall iſlands which are more to the ſouthward than theſe Breakers, without its being poſſible for him to ſee the land of BANCA (farther back, page 351).

TANJONG BREKAT is a high regular mountain (WILSON's Journal, page 5).

8. *EAST Point of BANCA.*

" The *eaſt point* has a *high hummock* over it, covered with trees, which " makes it ſeem a long way off; and, at firſt, whether from the northward or " ſouthward, it makes like an iſland." (WILSON's Journal, pages 5, 21, and 27).

" Off this point is ſeen, in coming from the northward, a remarkable " white perpendicular rock, looking like a ſail." (*Ibid.* page 25). " High, " white, needle rocks, bound the coaſt off the EAST Point of BANCA, but " do not ſeem to extend far off." (*Ibid* page 4.)

Captain CHANAL, at the moment when GASPAR in one with TREE Iſland bore eaſt-north-eaſt, and the EAST point of BANCA ſouth-ſouth-weſt half ſouth, perceived an iſlot to the ſouthward of this point.

9. *MIDDLE* or *PASSAGE ISLAND, ſometimes called LONG ISLAND,* (by the *Malays* named PULO-LEAT.)

It is HERE, between the ſouth-weſt point of MIDDLE Iſland and the NORTH-EAST point of the peninſula of SEL, that is properly the WEST PASSAGE or GASPAR's STRAIT. Its length, is about 6 miles, and the two points lie, in regard to each other, ſouth 56° 15′ weſt and north 56° 15′ eaſt. The SOLIDE anchored

anchored in the middle of the paſſage in 17 fathoms water, over a bottom of ſand and gravel.

WILSON, who, like Captain MARCHAND, took his route through the middle of the channel and kept in it, had very regular ſoundings; and the boat, which ſounded a cable's length within the ſhip, had the ſame ſoundings. (Page 25 of his Journal)

" MIDDLE or PASSAGE Iſland is a long iſland covered with trees, having " many hummocks or riſings on it, which makes its firſt appearance like " ſeveral iſlands." *(Ibid)*.

" The iſland off of PASSAGE Iſland does not appear as one till you are to " the ſouthward of it, and then the *Rocks* are ſeen projecting from ſome diſ- " tance off to the weſtward. They are high, white, needle rocks of the " deſcription of thoſe which bound the coaſt of the EAST Point of BANCA," *Ibid* page 5. It is, no doubt, theſe very rocks that WILSON means, when he ſays, page 27, " There are ſeveral curious white rocks, which ſeem de- " tached from the ſhore of PASSAGE Iſland to ſome diſtance, they are erect " ſpirally rocks, like needles."

Captain Chanal in like manner remarks that he did not ſee the ſmall iſland begin to appear detached from the large one, till the former bore north 17° eaſt.

Captain STEPHEN WILLIAMS of the SULIVAN (being nearly in the middle of the Paſſage) had MIDDLE Iſland, which he calls LONG Iſland bearing from ſouth 9° weſt to ſouth 79° eaſt, and from this angle of bearing, " LONG " Iſland" ſays he, " was ſhutting in with it a ſmall iſland which lays off the

" ſouth

" ſouth end of Do. diſtant off ſhore 4 or 5 miles." (This diſtance is not 2 miles taken from the ſouth-weſt point of the large iſland to the north point of the ſmall one). " A ridge of rocks," continues he, " runs off the ſouth end of " Do. 1½ mile, and another off the north end, about 1 mile, with a ſmall white " ſandy iſland in the middle. Found a current ſetting ſo ſtrong right in ſhore " that I could but juſt weather the ſouthernmoſt extreme *."

Captain Cooper ſays, in a Note written on his chart, that the SOUTH-EAST point of Banca is formed by rocks on which the ſea beat and that they ſeemed perfectly white, as if covered with ſalt. This ſouth-eaſt point is remarkable only for ſhips which take the EAST Passage, called Clements' Strait to the eaſtward of Middle Iſland.

10. *Peninſula of* Sel.

Several old charts and plans make of this peninſula an iſland under the name of Ile de Sel (Salt Island of the Engliſh); but the bearings and remarks of modern navigators have nearly reduced it to a certainty that this portion of land is connected to the main land of the iſland of Banca, by lands ſo low that, from a certain diſtance, they cannot be perceived: this is particularly the opinion of Captain Cooper who entered the ſtraits from the ſouthward; he ſays " the *Land* forms a conſiderable projection, from the " *South point* of Banca to the *Eaſtward*, Mr. Gaspar makes *this land*, an " *iſland*; I think to the contrary, as *low land* was ſeen to join to the *high land*." (Page 21 of his Journal).

The two iſlands ſituated to the northward of the northern coaſt of the peninſula of Sel afford not room for any particular remark: I refer the reader

* *Memoirs publiſhed by Alexander Dalrymple, Appendix to Memoir of Chart of Sunda and Banca*, page 18.

to

to what I have before ſaid of their poſition in regard to the main land of BANCA (page 380, paragraph IX.) " The largeſt, which is the eaſternmoſt, " is moderately high, and is covered with trees." (WILSON, page 25).

The gulf or bay which runs far inland between the EAST point of BANCA and the NORTH-EAST point of the Peninſula of SEL has not yet been examined; but there is reaſon to believe that it is full of overfalls and ſtrewn with ſhoals, if we may judge of it from the ſoundings which Captain WILSON had, when, wiſhing to borrow upon BANCA, the weather ſhore to anchor, he hauled in too much to the weſtward to the ſouth-eaſt by ſouth of the EAST point of the iſland; but, ſhoaling his water very ſuddenly, he was obliged to anchor and relinquiſh the project of ſtanding into the bay. (Farther back, page 417, note *).

On GASPAR's chart (N° 48 of the 2nd edition of D'APRÈS' *Neptuue Oriental*), the Peninſula of SEL is repreſented as an iſland ſeparated from BANCA by a channel from 10 to 12 miles wide; its eaſtern coaſt is furniſhed with a great number of iſlots; and, between its weſtern coaſt and the eaſt coaſt of BANCA is ſcattered an archipelago of other ſmall iſlands: but it appears that theſe iſlots and this archipelago are the produce of GASPAR's imagination; and it is ſeen, from his track marked on his chart, that he had it not in his power to examine the Gulf, nor to ſee diſtinctly a part of the eaſt coaſt of BANCA, which modern navigators affirm cannot be diſtinguiſhed from the middle of the channel. WILSON tells us that when " the EAST point of " BANCA bore north 84° weſt of him eſtimated diſtance 5 or 6 miles, there " was no land viſible betwixt the ſouth-weſt and ſouth-ſouth-weſt $\frac{3}{4}$ weſt, and " that the coaſt trenches away into a deep bay," (page 23 of his Journal). It was not till he brought the EAST point of BANCA to bear north 28° weſt

that

that "the land at the bottom of the bay was ſeen from the maſt-head, but "not from the deck." (*Ibid, page* 25).

The reef off the NORTH-EAST point of the peninſula of SEL merits particular attention.

"*High, white, needle* Rocks" ſays WILSON (*Ibid*, page 4) "bound the coaſt "of the eaſt point and ſouth-eaſt Point of *Banca*, but do not ſeem to extend "far off. They are the moſt ſtriking peculiarity belonging to this coaſt and "the iſlands about it; they ſhew themſelves in front as white patches upon "the land, which forms the back-ground*, and appear off the points, high, "bold, and ſpirally; but as they are viſible, they are not dangerous."

This is not the caſe with the reef, which takes its riſe at the ſame point. "It runs off a mile and a half, at leaſt, to the eaſtward," ſays WILSON (*Ibid*, page 32), "and makes the Paſſage betwixt *It* and the ſouth-weſt end "of PASSAGE Iſland, not more than 5 miles wide; many of the rocks are "as high out of the water as a pinnace, though they may be more covered at "a different time of tide, as, whether it was high or low water," continues WILSON, "when we were abreaſt of them, I know not. The ſoundings "abreaſt of the reef are upon a rocky bottom, which, probably extends all "the way acroſs to PASSAGE Iſland." We are very much inclined to adopt this opinion of WILSON, when we ſee that off the ſouth part of PASSAGE Iſland, oppoſite to it, lie rocks detached from the iſland, which have the ſame form, and the ſame appearance as thoſe which ſurround the NORTH-EAST point of the peninſula of SEL. (WILSON's Journal, page 32.)

* It is probable that the colour of theſe rocks, which have the appearance of rocks of *ſalt*, occaſioned the name of *Ile de Sel* to be originally given to this projecting part of *Banca*, which was taken for an iſland.

Weare ignorant how far the reef may extend to the ſouthward; but its extent to the northward is better known: Captain LARKINS had it in his power to examine it much cloſer than he would have wiſhed; for his ſhip ſtruck on the head of the Reef.

After having, with conſiderable difficulty, ſucceeded in heaving his ſhip off the reef, which we have termed the WARREN HASTINGS's Shoal, he ſays "In "the morning at day-light I weighed, and, at firſt, ſteered a mid-channel "courſe; but getting a caſt of 10 fathoms, I then determined to keep at the "diſtance of about five miles from the *weathermoſt* ſhore *, or *Sal* Iſland (the "Peninſula), and ſteered accordingly, with very regular *Soundings*, of 15 from "16 fathoms, for 3 leagues, the Deep-Sea-Lead conſtantly going, in one "Chain, and a Hand-Lead in the other. We had a very fine breeze at "N.N.E. was going 5 Knots, and was from 15 fathoms alarmed by the Ship "taking the ground, although it ſtopt her way very little. The Man in the "Starboard Chains had *four* fathoms, and the Man in the Larboard Chains "(next to the peninſula) *eleven* fathoms. I immediately brought up with a "Bower-Anchor in $9\frac{1}{2}$ fathoms. I ſent the Cutter to ſound in ſhore of us, "and had 7 and 10 fathoms: but obſerving a *Rock*, not before ſeen, bearing "S. by E.; called the Boat back, and determined to caſt to the Eaſtward, and "keep more mid-channel, by which we fortunately got out ſafe." (See LARKINS's Journal, pages 3 and 4).

* Captain *Larkins* tells us, a few lines farther on, that the wind was at *north-north-eaſt*; therefore the *weathermoſt* ſhore, with reſpect to the ſhip, would be rather that of *Middle* Iſland than that of the peninſula; no doubt, by the expreſſion of *weathermoſt* ſhore, he means that part of the peninſula which, with the wind from the north-eaſt quarter, is to windward of the reſt of this ſame land, that is to ſay, its *north-eaſt* point. But we do not yet well underſtand how *Larkins*, who by his own account, intended to keep in the *middle* of the channel, which is ſcarcely *ſix* miles wide would keep at the diſtance of *five* miles from one of its ſides; all that can be concluded from his account, is that he had got *too much to the weſtward*.

II. *South Coast of the Island of* BANCA.

Captain COOPER has laid down on his Chart, parallel to the south-east coast of the Island of BANCA, and at 3 or 4 miles' distance, a line of soundings, varying from 8 to 12 fathoms: he has drawn it from the account of a Portuguese Pilot, Sr. BARBE *, who likewise indicated to him two long shoals parallel to this line, and about 3 miles more to the offing. The Portuguese told him that sometimes the sea breaks on these shoals. (*Note written on* COOPER's Chart.)

It will not be useless to indicate here the different lands which present themselves to the view, when a ship gets out of GASPAR's STRAIT in coming from the northward: this indication may likewise serve for ships that are bound through the STRAITS from the southward.

At the moment when Captain WILSON set the most eastern of the two islands situated to the northward of the Peninsula of SEL in one with the North-east Point of this Peninsula, north-west by west, and that the small island situated to the westward of PASSAGE Island, barely visible, bore north half west, he also set:

A very small low island covered with trees . . . . . N.E. by N.
Another. . . . . N.E. $\frac{1}{2}$ N.
Another at a distance. . . . . N.E. $\frac{3}{4}$ E.
Another larger; and one, beyond it, in one with it N.E. by E.

* Thus written in the original: *Sr.* is, no doubt, the abbreviation of *Senhor*, *Monsieur* in French, Mr. in English.

An

An iſland alſo in ſight, from the deck, looking like ſingle trees *, bearing ..... S.E. $\frac{1}{2}$ E.

The Extremes of PASSAGE Iſland, almoſt hidden in a miſt..... from N. to N. by E. $\frac{1}{2}$ E.

At the ſame time, he ſet on the weſt ſide, the South-weſt Point of *Banca* in ſight, ſo diſtant as to be disjoined ..... W. $\frac{1}{4}$ S.

The ſouth end of BANCA, which extends from the ſouth-eaſt Point of the Peninſula to the laſt-mentioned ſouth-weſt Point of BANCA, in ſight, forms a Bay which muſt be rather deep; for, from the deck, the land did not appear to join; and it was only from the maſt-head that the head of the bay could be perceived. This part of the Iſland of BANCA preſents a ſomewhat wide opening, in the midſt of which riſes a very remarkable hummock that bore weſt by north $\frac{1}{4}$ north from the ſhip: WILSON had ſet it previouſly, before he had paſſed the Strait ſouth 50° weſt in one with the moſt eaſtern of the two iſlands which are ſituated to the northward of the Peninſula. This hummock ſerves, with the ILES DE LA RECONNOISSANCE (SHOAL-WATER Iſland) which bear nearly eaſt-ſouth-eaſt from it, to diſtinguiſh the two Straits, when bound through either from the ſouthward †.

From the poſition where WILSON was, there was alſo in ſight from the

* Theſe ſmall iſlands compoſe the two groups ſituated to the ſouth-eaſt of *Paſſage* Iſland, and form with this iſland the Paſſages of *Clements' Strait*.

† On caſting an eye on the VIEW *of the ſouth part of the Straits*, taken by *Dordelin* (Plate VII), it is ſeen that it is eaſy for a ſhip coming from the ſouthward to diſtinguiſh *Gaſpar*'s Strait which is the firſt *opening* that preſents itſelf to the *weſtward*, and through which is perceived in the diſtance the open ſea to the northward of the Straits.

maſt-head, an iſland about half a point of the compaſs to the ſouthward of what he ſet for the ſouth-weſt Point of BANCA, which bore weſt half ſouth.

Two hours and a half after having taken the Bearings which I have juſt mentioned, and at the moment when the ſouth-weſt Point of BANCA bore weſt-north-weſt half north, and PASSAGE Iſland, appearing in lumps, like ſeveral ſmall iſlands, north by eaſt, WILSON ſet a ſmall iſland juſt viſible, north-eaſt half north, and another eaſt half ſouth. He adds that the officer from the maſt-head reported that he ſaw *high land* bearing about eaſt, which muſt be BILLITON.

In this poſition, the ſoundings were 13 fathoms. (*See* WILSON's Journal, pages 31 and 32).

12. *Irregularity of the ſoundings to the ſouthward of the Straits.*

Captain LARKINS, from his experience, points out to navigators the track which they have to follow when, coming from the northward, they have paſſed through GASPAR'S STRAIT. " I would adviſe ſhips that are bound " through the *Straits*," ſays he, " not to ſteer *too ſoutherly* a courſe, as it is to " that I impute the very *irregular Soundings* we had, which ſo alarmed us that " we came to an anchor; and from the cutter's *Soundings* in ſhore (near " BANCA) it may be concluded that $5\frac{1}{2}$ or 4 leagues' diſtance from the ſouth " coaſt of SAL (the Peninſula of SEL, he does not ſay in what bearing), " there is very good ſoundings. I would therefore adviſe any ſhip after " having an offing of 4 leagues from the Straits' mouth,) no doubt to the " ſouthward of the mid-channel where he had determined to keep, (farther " back

" back, page 433), not to ſteer to the ſouthward of South-weſt *, until ſhe meets with a *muddy bottom?* (*See* LARKINS's Journal, page 4).

It has been ſeen in the *narrative* of Captain MARCHAND's Voyage (page 105 of this Vol.) that, on the 23rd of December, the SOLIDE after having cleared the Strait, and being to the ſouth-ſouth-eaſt and ſouth by eaſt of the ſouth Point of the Peninſula of SEL, ſhoaled her water ſuddenly from 17 fathoms to 9, bottom of ſand and gravel, and that from half paſt 10 in the morning to half paſt 11, the ſoundings varied only from 8 to 9 fathoms; and from 10 fathoms to 11 till noon: at this laſt period, ſhe had, by obſervation, reached the latitude of 3° 30′, and no longer perceived any other lands than the ſouth coaſt of BANCA extending from north-weſt by weſt to north-north-weſt half north.

Captain WILSON, after having given the bearings from his ſtation *e* †, which place it on his chart ſouth 14° eaſt, and at about the diſtance of 16 miles from the SOUTH-EAST Point of the Peninſula of SEL, adds: " South-ſouth-weſt " half weſt 3 miles from this ſtation, ſhoaled our water ſuddenly to 7 fathoms, " *hard bottom*; hawled the point off ſouth-eaſt by ſouth, for about 10 mi- " nutes, and then deepened to 11 fathoms, *muddy bottom*; ſteered afterwards " ſouth. By theſe *irregularities* in the *ſoundings*, the *ſhoalneſs* of the *water*,

* Theſe are the words of the Original.—I own that I do not underſtand what Captain *Larkins* means, when he adviſes a ſhip *not to ſteer to the ſouthward of South-weſt*, which ſignifies, in other terms, that taking the *South-weſt* as a fixed point, you muſt ſteer, with reſpect to it, rather towards the *Weſt* than the *South*: for, on looking at the chart of the Straits, it ſhould ſeem, on the contrary, that one ought to ſteer *more to the ſouthward than ſouth-weſt*, ſince a courſe *to the weſtward of ſouth-weſt* would bring a ſhip too near the ſhoal the vicinity of which, it appears, ought to be carefully avoided. (*See* farther on what *Wilſon* ſays on this ſubject.)

† The ſouth-weſt Point of *Banca* N. 62° W.—The land between the *North-eaſt* Point and ſouth-eaſt Point of the Peninſula N. 11° W.—And *Paſſage* Iſland, appearing in lumps like ſeveral ſmall iſlands, N. 11° E. (*Wilſon*'s Journal, page 3.)

" and

" and the *hard bottom*, I take it," adds he, " that we muſt have been upon " the *edge* of the *ſhoal*, which ſtretches ſo far to the ſouthward of BANCA." (Page 3 of his Journal.)

Mr. DALRYMPLE obſerves in a note, that " the *Extent* and *Nature* of this " *Shoal* is not well aſcertained, nor is it certain that it unites to BANKA." *(Ibid.)*

13. *Of* CLEMENTS' STRAIT, *or the* EAST PASSAGE *in coming from the Southward, or in coming from the Northward.*

The track of Captain COOPER, in coming from the ſouthward, is that which paſſes the neareſt to MIDDLE Iſland, at the diſtance of 2 miles only from its ſouth-eaſt Point, and leaving on the ſtarboard hand, on entering, all the ſmall iſlands which are ſeen at the ſouthern mouth of CLEMENTS' STRAIT or the EAST PASSAGE.

COOPER ſays that the channel, by which he entered, is very good; that he had conſtantly from 19 to 23 fathoms, and that he paſſed within 1½ mile of the ſmall iſland, which he names SANDY-BEACH Iſland, but which CLEMENTS or ROBERTSON, ſimply calls SANDY Iſland. He adds that to the ſouthward of this iſland, he ſaw the water of a green colour, and that the Portugueſe Pilot, Sr. ST. BARBE, in company with whom he was ſailing, told him that the ſea was frequently ſeen to break in this part. (Page 22 of COOPER's Journal).

I obſerve that it may be true, as the Portugueſe Pilot ſaid that, ſomewhere to the northward of SANDY-BEACH Iſland, the ſea breaks ſometimes; but that, however, the track of the ROYAL ADMIRAL which is marked on

ROBERTSON's

ROBERTSON's Charts and large Plan, does not paſs at the difference of more than 1 mile to the northward of SANDY-BEACH, with a depth of water of 19—20—19 and 22 fathoms; and that this ſhip anchored in 19 fathoms, to the north-weſt of this iſland, and 1 mile only from the ſand-bank which ſurrounds it. But in ROBERTSON's ſame charts is laid down to the northward of the iſland, at 2 miles diſtance from the northern part of its ſhoal, a ſtring of Breakers which occupy a ſpace of upwards of 2½ miles on a north and ſouth line: and this Reef is placed between the track of the ATLAS, Captain COOPER, and that of the ROYAL ADMIRAL, Captain ....., at about the diſtance of half a mile from each other in their greateſt proximity. It appears therefore that, in fact, there exiſts a Reef to the northward of SANDY-BEACH Iſland, as the Portugueſe Pilot told Captain COOPER, but that this Reef leaves between it and the iſland, a good paſſage, over 19—20—22 and 23 fathoms, through which the ROYAL ADMIRAL paſſed.

COOPER thus deſcribes the paſſage by which he entered; in going from the ſouthward to the northward, "you paſs within 1½ mile of a *ſmall ſandy beach* "*Iſland*, on the ſtarboard hand, with a cluſter of iſlands well wooded; on the "other hand, you have MIDDLE Iſland*, which is of conſiderable extent." (Page 22 of his Journal).

It appears that the Strait BETWEEN BANCA AND BILLITON was known to Captain COOPER only by the copy which Mr. DALRYMPLE had cauſed to be engraved on the defective chart of GASPAR, publiſhed by D'APRÈS in his

* On *Cooper*'s Chart, is written *Middle Iſland* or *Salt Iſland*; it is improper in him to confound theſe two denominations, and ſuppoſe that *Middle* Iſland and the Peninſula of *Sel* are a ſame land, a ſame iſland. The former, which the Engliſh commonly call *Paſſage Iſland* and ſometimes *Long Iſland*, is the large iſland which divides into two arms the whole Strait *between Banca and Billiton*, and the iſland, or rather the Peninſula of *Sel*, is as has been ſeen, that projecting part of *Banca*, which, with *Middle Iſland* forms the *Weſt Paſſage*, or *Gaſpar's Strait*.

Neptune

Neptune Oriental; for he tells us in his *journal* (page 22) before he had reached the Paſſage through which he paſſed that " there ſeems *to be a good Paſſage* be- " tween MIDDLE Iſland and BANCA (this is GASPAR's STRAIT). It ſeems to " me," adds he, " to deſerve the preference; it being wide, I ſhould have pur- " ſued this track, but by my friend, the *Portugueſe* (Sr. ST. BARBE) ſaid it " was not good."

It may have been conceived from the deſcription which has been given of the WEST PASSAGE, and it may be ſeen, by the inſpection of the Chart, that the Portugueſe, although a Pilot for theſe ſeas, was ill informed; but doubtleſs that, like many others, his lazineſs, and his indifference found it more convenient to take the paſſage which he had always uſed, than to aſcertain whether that with which he was not acquainted was not leſs difficult and better: Captain COOPER who paſſed the Strait for the firſt time, ſaw and judged better than the Portugueſe Pilot; inſtead of following the *Senhor* ST. BARBE he ought to have guided him.

On ROBERTSON's Charts and Plan, I remark to the north by eaſt $\frac{1}{4}$ eaſt of SADDLE Iſland (which is COOPER's FLAT Iſland), and on the parallel of ROBERTSON's BARN Iſland (COOPER's BUTTON Iſland) a *dangerous Rock* which is not at the diſtance of a mile to the weſtward of CLEMENTS's track. We find, on this ſubject, what follows in the Sailing Directions which are engraved on the *Plan of Clements' Strait* which Mr. DALRYMPLE had inſerted, in 1786, in his *Collection*, two years before the publication of the ſame Plan by ROBERTSON:

" The paſſage through the ſmall Iſlands is between THWART THE-WAY and " SOUTH Iſland to the eaſtward, and SADDLE Iſland to the weſtward, about " mid-channel, or rather nearer to THWART-THE-WAY ſide, on account of a

" rock with *one foot and a half* water on it: the rock is not bigger than a " long-boat, and has 5 or 10 fathoms all round it, with no appearance of " danger. Bearings, THWART-THE-WAY eaſt by north $3\frac{1}{2}$ or 4 miles; SAD- " DLE Iſland (COOPER's FLAT Iſland) ſouth by weſt $\frac{1}{4}$ weſt $3\frac{1}{2}$ or 4 miles; " BARN Iſland (COOPER's BUTTON Iſland) weſt by ſouth; ſouth point of MID- " DLE Iſland weſt-north-weſt. In going through this Strait, it is neceſſary to " have a boat always ahead ſounding."

Captain CLEMENTS, in coming from the northward, in order to paſs between the Iſlands of BILLITON and BANCA by the Paſſage or Strait which has received his name, made the land on the north-weſt point of BILLITON, and found himſelf entangled, with the fleet which he commanded, in a Bay ſituated to the ſouth-weſt of this point, which he named, with reaſon, TREACHEROUS BAY.

" In coming through theſe Straits from the northward, you muſt take care, " and not get far into TREACHEROUS BAY, as it is all over *foul*, ſome of the " banks juſt appearing at low water: others $1\frac{1}{2}$ and 2 fathoms under water; " they are ſmall with good ſoundings between them, as 10, 9, and 8 fathoms " ſand, and without the leaſt appearance of ripplings, or danger owing to " the ſmoothneſs of the water, which led us to believe it to be a ſafe bay, " till the EARL MANSFIELD ſtruck upon the rock to the ſouthward of the " VANSITTART's anchorage in the bay, diſtance about 2 cables' length. The " PIGOT, in ſailing out, half a cable's length to the northward of the VAN- " SITTART at anchor, ſtruck and with ſome difficulty, got off, it being ebb " tide at the time ſhe got on. At the ſame time ſaw the reef to the north- " ward of the PIGOT's rock, in many places dry, to which he muſt have paſſed " very cloſe in coming in."

14. *The Strait* BETWEEN *BANCA and* BILLITON, *to be preferred to the Strait of* BANCA.

The opinion of Captain WILSON muſt here be of great weight. His navigator had been ſpecially charged by *Inſtructions* from the *Court* of *Directors* of the *Eaſt-India Company*, to examine carefully the STRAIT TO THE EAST OF BANCA, in order to fix a yet doubtful opinion, and to aſcertain whether this Strait ought to merit a preference to that of BANCA, as well for ſhips bound to CHINA, as for thoſe returning thence. Captain WILSON, in a letter which he writes to Mr. DALRYMPLE, on addreſſing to him his chart of GASPAR'S STRAIT and his remarks on this paſſage, obſerves that, " the knowledge " of this track at the back of BANCA is now become doubly deſirable, ſince " the Honourable Company have come to the reſolution of employing ſuch " large ſhips in their CHINA Trade. The danger of the paſſage by LUCEPARA " (Strait of BANCA) is obvious from the many ſhips which have grounded " near it, particularly this laſt ſeaſon." (*See* page iv of his Journal). This letter is dated in November 1787.

" For myſelf," ſays WILSON, " I prefer this paſſage *coming from* CHINA, " to the one through the Straits of BANCA. This ſtrait is very ſhort com- " pared with *that*, and it is even poſſible for a ſhip to paſs it without anchor- " ing at all; but at moſt ſhe can have no occaſion to anchor more than one " night, if ſhe has wind and clear weather." (Page 34 of his Journal.)

" The eligibility of this paſſage, for ſhips *outward bound*, is another con- " ſideration, and here I muſt confeſs," ſays WILSON, " I cannot give it the " ſame preference. Beſides, that I believe ſhips would hardly ever be able " to fetch it from the BROTHERS * (theſe are LES DEUX SŒURS on the French

* Mr. *Dalrymple* obſerves in a note, that " The ſhips *outward bound*, that have gone this way, did not find any difficulty; but certainly ſhips, intending to go this paſſage ought to paſs to the eaſtward of the *Brothers*," (Page 36 of *Wilſon*'s Journal.)

" Charts);

" Charts); till the extent of the dangers of the South end of BANCA are " better known, the approach to it muſt be very dangerous, and we ſeem to " be equally ignorant of what dangers may lie off the numerous iſlands lying " to the ſouth-eaſt of PASSAGE Iſland, which makes the Eaſt ſide of the " Strait. Were the entrance once explored and found ſafe, the Paſſage " would deſerve every preference."

It appears that Captain WILSON at the time when he wrote, had no knowledge of the tracks of the ſhip TRITON, commanded by DORDELIN, having under his orders the PROVENCE and the SAGITTAIRE, of the ROYAL ADMIRAL, Captain ....., of the ATLAS, Captain COOPER, and of all the Portugueſe ſhips of whoſe names we are ignorant, all which, and in different ſeaſons, have entered the Straits from the ſouthward, and experienced no difficulty, nor run any danger in the paſſage. We muſt even obſerve that they were not aſſiſted by the information of their predeceſſors, and that, at this day, when the inſtructive journals, and plans drawn by intelligent and enlightened navigators have made known minutely the different Paſſages which are open between BANCA and BILLITON, a ſhip may enter them with ſafety from the ſouthward as well as from the northward. The uncertainty which ſtill prevails reſpecting the real extent of the ſhoals ſituated to the ſouthward of the Peninſula of SEL, and of thoſe which may exiſt to the ſouth and to the ſouth-weſt of SHOAL-WATER Iſland, requires that navigators ſhould be cautious in making the land when they come from the ſouthward; as the Breakers ſituated to the northward of BANCA, to the north by weſt and weſt-north-weſt of GASPAR Iſland require that they ſhould navigate with prudence, and keep a good look-out, when they are bound through the Straits from the northward. But has not the Strait of BANCA alſo its dangers and its ſhoals, to which muſt be added the difficulties and the length of its navigation? At leaſt theſe two laſt mentioned inconveniencies are not annexed to the firſt, in the

the STRAIT BETWEEN BANCA AND BILLITON, whether the navigator take the EAST PASSAGE (CLEMENTS' STRAIT) or prefer the WEST PASSAGE (GASPAR'S STRAIT) which, in general, appears to merit the preference to the other, as well by ſhips coming from the ſouthward, as by thoſe coming from the northward.

EIGHTH RUN.

From the Iſle of RÉUNION to the Iſland of ST. HELENA.

1. *From the Iſle of* RÉUNION *to within ſight of the Coaſt of* AFRICA.

2. *From within ſight of the Coaſt of* AFRICA *to within ſight of the Iſland of* ST. HELENA.

NOTE LXIII.

On the 21ſt of April, at half paſt ſeven in the evening, the SOLIDE took her departure from within ſight of Port ST. DENIS in the Iſle of RÉUNION, in longitude 53° 8′ 00″ eaſt from the Meridian of PARIS (Port ST. DENIS is in 53° 10′ 00″ *Connaiſſance des Temps*, Year VIII.)

On the 28th, the reſult of four ſets of diſtances of the ſun and moon, obſerved in the morning, and reduced to noon of this day, gave for the longitude of the ſhip, at that inſtant, 42° 44′ eaſt; and, on comparing it to that of the point of departure on the 21ſt in the evening, which was 53° 8′, we ſee that her longitude had diminiſhed, or, which amounts to the ſame thing, that her progreſs towards the weſt had been 10° 24′.

According to the dead reckoning, this progreſs was only 8° 17′: thus the ſhip had been carried to the weſtward, or *ahead* of her apparent run, 2° 7′, or 115.5 miles.

In the firſt five days of this period, the currents had carried the ſhip to the *ſouthward:* 2—6— and 2 minutes, from the 21ſt to the 24th, 34 minutes from the 24th to the 25th, and in the laſt two days, 9 and 12 minutes to the *northward.* A compenſation having taken place of the quantities which do away each other, the movement had been 23 minutes, or 23 miles to the *ſouthward.*

On combining the 23 miles ſouthing with the 115.5 miles weſting, we find that the mean direction of the current had been weſt 11° 15′ ſouth, and its effect on the way of the ſhip which it carried in that direction, 117.2 miles in 6 days½ 16 hours, or, mean term, 17.57 miles in twenty-four hours.

NOTE LXIV.

On the 29th of April, freſh lunar obſervations, the reſult of which was reduced to noon, ſhewed that the longitude of the ſhip ought to be 39° 22′ eaſt, and on comparing it to that of the 28th, it was concluded that the progreſs towards the weſt, in twenty-four hours, had been 3° 22′.

The reckoning gave only 2° 58′: thus the ſhip had made an imperceptible progreſs towards the weſt, beyond that of the dead reckoning of 24 minutes, or 21.25 miles; at the ſame time that, according to the obſervation of latitude, ſhe had been carried 7 minutes or 7 miles to the northward.

The direction of the current had therefore been weſt 18° 30′ north, and its effect on the ſhip's way 22.25 miles in twenty-four hours.

NOTE

NOTE LXV.

On the 9th of May, a bearing of the land taken at noon, in ſight of the eaſtern coaſt of Africa, at a little diſtance from the meridian of the Cape of Good Hope, whoſe longitude is determined by good obſervations, ſhewed that the longitude of the ſhip, at that period, was 25° 57′ eaſt; and on comparing it to that which had been given by the obſervations made at ſea and reduced to noon of the 29th of April, that is, to 39° 22′, we find that, in the interval of 10 days, the longitude diminiſhed, or that the progreſs towards the weſt was 13° 25′.

If we compare with each other the longitudes deduced from the dead reckoning for the ſame periods of the 29th of April, and the 9th of May, 41° 53′ and 29° 28′, we find that the apparent progreſs towards the weſt was only 12° 25′; that is, that it was ſmaller than the progreſs deduced from the obſervations of the 29th and of the bearing of the 9th by 1 degree, or 51½ miles.

In the beginning of this period of ten days, the currents had ſet to the *Northward*; 13 minutes, from the 29th to the 30th of April;—3 minutes, from the 30th of April to the 1ſt of May;—and 11 minutes from the 1ſt to the 2nd; but, on the following days, they had ſet to the *Southward* with great velocity, and particularly from the 2nd to the 3rd, 33 minutes; from the 4th to the 5th, 16 minutes; from the 7th to the 9th 40 minutes. The ſum of the errors towards the *South* was 100 minutes, and if we deduct the 27 minutes *Northing*, there will remain for the effect of the current towards the *South*, 1° 13′, or 73 miles.

On combining the 73 miles ſouthing with the 51½ miles weſting, we find that

that the direction of the current was ſouth 35° 15′ weſt, and the whole of its effect on the ſhip's way had been 89.3 miles, and its mean effect, near 9 miles in twenty-four hours.

This rapid motion of the waters towards the ſouth, declining towards the weſt, cannot be matter of aſtoniſhment, if we take notice that, during this period, the ſhip was croſſing the great current which iſſues from the MOZAMBIQUE Strait, whoſe general direction is nearly north-north-eaſt and ſouth-ſouth-eaſt.

The longitude given by the dead reckoning, followed up from the departure taken from the Iſle of RÉUNION, on the 21ſt of April, to the bearing of the coaſt of AFRICA, on the 9th of May, was, at this later period, 29° 28′, and if we compare it to the true longitude deduced from the bearing, 25° 57′, we ſee that, in the interval of 18 days, the error of the reckoning was 3° 31′, or 181.5 miles *aſtern*, owing to the effect of the currents which daily carried the ſhip to the weſtward beyond her apparent progreſs towards that coaſt.

NOTE LXVI.

According to the obſervations for the longitude made on the 12th of May in the morning and reduced to noon of that day, the progreſs towards the weſt, ſince the bearing taken of the land, on the 9th in ſight of the coaſt of AFRICA, was 4° 8′; and according to the reckoning, 1° 9′, thence it was concluded that, in the interval of 3 days, the ſhip had been carried to the weſtward, beyond the apparent run towards that ſide, 2° 59′, or 147.4 miles.

During the ſame time, the ſhip according to the obſervations of latitude, had been carried 1° 43′, or 103 miles to the ſouthward.

On

On combining the 147.4 miles weſting with the 103 miles ſouthing, we find that the direction of the current, during theſe three days, was weſt 35° ſouth, and its total effect on the ſhip's way in that direction, 180 miles, or 60 miles in twenty-four hours: this is at the rate of $2\frac{1}{2}$ miles an hour.

NOTE LXVII.

Freſh obſervations made on the morning of the 13th and reduced to the moment of noon, indicated that, from the noon of the preceding day, the progreſs towards the weſt had been 0° 48′: and as it was 0° 45′ according to the dead reckoning, we may conclude that the current, whoſe tendency had before been towards the weſt and towards the ſouth, had been nearly null during the laſt twenty-four hours, in the former direction, ſince the difference is only 3 minutes or 2.45 miles.

At the ſame time, it had ceaſed to ſet to the ſouthward, and had even ſet, from the one noon to the other, 17 minutes, or 17 miles to the northward *; and this ſetting of the current, in an oppoſite direction to the former, may be attributed to a heavy ſwell from the ſouth-weſt, which muſt have ſet to the northward, and, perhaps, had ſet to the north-eaſt; but the part of the movement which belonged to the eaſting might have eſcaped obſervation. It ought to be remarked that the ſhip having now advanced ſufficiently to the eaſtward to be ſheltered from the action of the Mozambique current, ſhe muſt have ceaſed to feel its effect on the direction of her courſe and on the velocity of her progreſs.

* If we wiſhed to combine theſe 2.45 miles, weſting, with the 17 miles northing, we ſhould find that the ſhip had been carried 17.2 miles to the north 8° 30 weſt: but this would be to ſuppoſe that the obſervations may be ſufficiently exact for leading to the diſcovery of very ſmall errors in longitude.

NOTE

NOTE LXVIII.

By the obſervations of the 15th of May, in the morning, reduced to noon, the progreſs towards the weſt, from the 13th to the 15th, had been 1° 4′, and according to the dead reckoning, 1° 22′: it would therefore appear that, in the interval of thoſe two days, the ſhip had been carried 18 minutes, or 14.7 miles to the eaſtward.

In the ſame interval, ſhe appears to have been carried 3 minutes, or 3 miles, to the northward.

Theſe differences are, perhaps, ſo ſmall as not to deſerve attention; for the obſervations of longitude, on the one hand, and, on the other, thoſe of latitude, are not ſuſceptible of a degree of preciſion ſufficiently great to enable us to attribute deciſively the differences to the error of the reckoning: and it cannot be doubted that, in theſe ſeas, the currents ſet to the eaſtward.

If, however, we are willing to admit the reſults of the obſervations as fixed terms of compariſon, and combine the 14.7 miles eaſting with the 3 miles northing; we ſhall find that, in the two days, the ſhip was carried out of her apparent courſe, 15.2 miles, or 7.6 miles a day, to the eaſt 12° 20′ north.

NOTE LXIX.

From the 15th to the 16th, at noon, the progreſs towards the weſt was, according to the lunar obſervations made on the two days, 2° 10′; and according to the dead reckoning, 2° 12′: it is therefore greater by dead account than by obſervation, by 2 minutes or 1.6 miles. Thus, the obſervations of

this day confirmed thoſe of the preceding, and indicated a ſmall effect of the current whoſe tendency would be towards the eaſt, in a contrary direction to the general tendency of the currents in theſe latitudes.

The obſervations of latitude proved that, in the twenty-four hours, the ſhip had been carried to the ſouthward 9 minutes, or 9 miles, beyond the apparent progreſs towards that ſide.

On combining the two differences, 1.6 miles towards the weſt, and 9 miles towards the ſouth, we have, for the action of the current, 9.2 miles to the ſouth 10° eaſt.

NOTE LXX.

The reſult of the lunar obſervations of the afternoon of the 25th of May, reduced to noon of that day, and compared to that of the obſervations of the 16th likewiſe reduced to its noon, give 13° 5′ progreſs towards the weſt; and according to the dead reckoning, the progreſs was only 11° 59′: thus, in the interval of nine days, the ſhip had been carried to the weſtward 1° 6′, or 56.5 miles beyond her apparent progreſs.

The obſervations of latitude ſhewed that, at the ſame time, the ſhip had been carried almoſt conſtantly to the northward beyond her reckoning; ſhe had been accidentally carried to the ſouthward, 1 minute, from the 17th to the 18th, and 9 minutes from the 22nd to the 23rd: after having deducted the 10 minutes ſouthing, from 50 minutes, the ſum of the errors of northing, there will remain 40 minutes, or 40 miles, for the quantity which the ſhip was carried to the northward by the currents.

On combining theſe 40 miles northing with the 56.5 miles weſting, it will be

be found that the currents ſet to the weſt 35° 25′ north; that their effect on the ſhip's way was 69.3 miles in the courſe of the period; and their mean effect, 7.7 miles in twenty-four hours.

NOTE LXXI.

From the 25th to the 28th of May, at noon, the progreſs towards the weſt had been, according to the lunar obſervations, 3° 44′; and according to the reckoning, 2° 35′: the difference of theſe two quantities, 1° 9′ or 62.5 miles, expreſſes the quantity which the ſhip had, in three days, been carried to the weſtward, beyond her apparent progreſs.

In this ſame interval, the ſame cauſe had, according to the obſervations of latitude, carried her 35 minutes or 35 miles to the northward.

The 62.5 miles weſting, combined with the 35 miles northing, give for the direction of the current, weſt 29° 20′ north; for its effect on the ſhip's way, in three days, 71.5 miles; and for its mean effect in twenty-four hours, 23.8 miles.

NOTE LXXII.

From the 28th to the 29th of May, at noon, progreſs towards the weſt, according to the lunar obſervations, 1° 13′, and according to the dead reckoning 1° 5′: the ſhip had therefore been carried to the weſtward 8 minutes, or 7 27 miles.

The latitude by account, on the 29th, agrees with the latitude by obſervation.

We may therefore consider the action of the currents as null during these twenty-four hours; for the difference of 8 minutes, between the account and the observation, in the progress towards the west, may be attributed to the one as well as to the other.

NOTE LXXIII.

The observations for the longitude made on the 30th, gave for the progress towards the west in the last twenty-four hours, 1° 28′, and the dead reckoning gave 1° 29′. This trifling difference of 1 minute or 0.94 miles, in excess on the side of the reckoning, is not worth attention; but if we chose to combine it with the 6 minutes or 6 miles, which the ship had been carried to the northward in the same interval, we should find that the current set to the north 8° 30′ east, and that its effect on the ship's way was, in this direction, 6.1 miles.

NOTE LXXIV.

The observations of latitude shewed that, on the 30th of May, the currents had continued to set to the northward: from the 30th to the 31th, 13 minutes;—from the 31st of May to the 1st of June, 6 minutes;—from the 1st to the 2nd, 11 minutes;—from the 2nd to the 3rd, 3 minutes:—in all 33 minutes or 33 miles in the interval of four days.

On the 3rd of June, half an hour before noon, our navigators got sight of the Island of St. Helena; and its eastern extreme bore west by south, at about the distance of 12 leagues; thus the ship was 6 or 7 minutes to the northward of the point whence the bearing was taken.

But this Point is situated nearly in the Parallel of James Town, the prin-

cipal place in the iſland, whoſe latitude the obſervations of the aſtronomer royal NEVIL MASKELINE have fixed at 15° 55′: the latitude of the ſhip muſt therefore be 15° 49′ or 48′, and it was obſerved in 15° 49′.

On the 4th, at nine o'clock in the morning, SUGAR-LOAF Point bore weſt-ſouth-weſt; and the eaſtern extreme in ſight, directly ſouth. From the point whence this bearing was taken till the moment when the SOLIDE dropped anchor in the road of JAMES TOWN, the ſhip had advanced 4 or 5 miles, or about 5 minutes to the weſtward: we may therefore reckon that the point on whoſe meridian ſhe was, is ſituated 5 minutes to the eaſtward of JAMES TOWN; and as the longitude of this town, fixed by the obſervations of MASKELINE, is 8° 9′ 00″ weſt from PARIS, the longitude of the point ſet which was alſo that of the ſhip, is 8° 4′.

Since the 30th of May there had been no opportunity of making lunar obſervations: but as two ſets of obſervations, on two ſucceſſive days, proved that, from the 28th to the 30th, the currents had in a very ſmall degree affected the apparent progreſs of the ſhip to the weſtward, we may with ſome confidence employ the dead reckoning, from the 30th of May, the laſt day of obſervation, to 9 o'clock in the morning, on the 4th of June, the period at which the calculation was ſtopped. The progreſs of the ſhip towards the weſt, in this interval, is, according to the reckoning, 6° 21′ (*See* the JOURNAL OF THE ROUTE, on the 30th of May and 4th of June): if we add theſe to the longitude deduced from the lunar obſervations, for the noon of the 30th of May, which was 1° 43′ weſt, we ſhall have for the longitude of the ſhip, on the 4th of June, at 9 o'clock in the morning, 8° 4′; and this is exactly the ſame as that which was given by the bearing: which proves that the reſult of the obſervations of the 30th from which our navigators had begun

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to regulate the courſe in ſtanding to make St. Helena, was as correct as can be deſired for the ſafety of navigation.

This is not the caſe with the longitude which they would have ſuppoſed, if, for directing their route, they had had only the reſult of the dead reckoning from the point of departure taken in ſight of the coaſt of Africa, on the 9th of May, in 25° 57′ eaſt longitude: for, according to this calculation, the longitude of the ſhip, on the 4th of June, at 9 o'clock in the morning, ought to be 3° weſt: and as it has been ſeen that the true longitude, at this period, was 8° 4′, it follows that the longitude by account was *aſtern*, after twenty-five days only, 5° 4′ or 97⅓ leagues on the parallel of St. Helena. If we add to this error that of 3° 31′, which the dead reckoning was already *aſtern* when it was corrected on the 9th of May, in ſight of the coaſt of Africa, we ſhall have for the total error of the Run, till the period of the laſt obſervations, on the 30th of June 8° 35′, or upwards of 167 leagues in thirty-nine days.

On recapitulating all the errors of the reckoning in the courſe of the Run, from the Iſle of Réunion to the Iſland of St. Helena, we ſhall have the following Table, the reſult of which agrees with the account that I have juſt preſented.

1. *From the Isle of* Réunion *to within sight of the Coast of* Africa.

Errors towards the East or *Astern*.			Errors towards the West or *Ahead**.
From the 21st to the 28th in	7 days 2°	7′	
From the 28th to the 29th in	1 0	24	
From the 29th May to the 9th ..... in	10 1	0	
in	18 days 3	31	

2. *From within sight of the Coast of* Africa *to the 30th of May, the period of the last observations made before making the land on* St. Helena.

From the 9th to the 12th in 3 days	2°	59′		
From the 12th to the 13th in 1	0	3		
From the 13th to the 15th in 2			.....	0° 18′
From the 15th to the 16th in 1			.....	0 2
From the 16th to the 25th in 9	1	6		
From the 25th to the 28th in 3	1	9		
From the 28th to the 29th in 1	0	8		
From the 29th to the 30th in 1			.....	0 1
Astern	8	36	*Ahead*	0 21

Remainder, in 39 days, Error *Astern* ..... 8° 35′

* The errors *Ahead* appear extraordinary in the seas where the *Solide* was sailing: they may possibly belong to the observations which, for want of precision, cannot reach the little differences.

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The firſt part of this Run, from the Iſle of Réunion, to within ſight of the Coaſt of Africa, exhibits to us the great effects of the movement of the waters, which produce derangements ſo conſiderable on the courſe of the ſhip, as long as ſhe remains expoſed to the action of the current of the Mozambique Strait: it may be ſeen in the *Narrative* (page 124 of this volume) that theſe derangements are ſometimes ſtill more conſiderable than that which the Solide experienced, and which was increaſed in the beginning of the ſecond Part of the Run, from the 9th to the 12th of May.

In this ſecond part (from within ſight of the Coaſt of Africa to the Iſland of St. Helena) the currents ſet almoſt conſtantly to the weſtward, with unequal degrees of velocity, and declining ſometimes towards the north, ſometimes towards the ſouth. But it appears that, from the 28th of June, when the ſhip had reached the South Tropic, the waters ceaſed to carry the ſhip to the weſtward, or that at leaſt their effect was ſo imperceptible, that it eſcaped obſervation: and this muſt appear extraordinary; for it is reckoned that between the tropics, the waters have a general movement from eaſt to weſt; and it is ſuppoſed that this movement increaſes the apparent progreſs of the ſhip towards the weſt, 8 or 9 miles in twenty-four hours: it is, on the contrary, to the ſouthward of the tropic that the ſhip was carried to the weſtward, and we are nearly convinced that ſhe experienced no ſuch tendency between the tropics; for, on applying to the longitude obſerved at ſea on the 30th of May, the progreſs towards the weſt as it was given by the dead reckoning during the interval of five days, we find, on the 4th of June, off James Town in the Iſland of St. Helena, exactly the ſame longitude as that which had been determined by the aſtronomical obſervations of Maskeline. If the ſhip were carried to the weſtward, for this effect to have occaſioned no error in her longitude on making the land, the error on the reſult of the obſervations made at ſea, on the 30th muſt have been counterbalanced by

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an error precisely equal, and in a contrary direction, in the reckoning from the 30th of May to the 4th of June; which would not be absolutely impossible, but which, however, is improbable.

The movement of the waters which deranged the ship in the direction of the latitude was almost constant during the Run, but unequal in velocity, and sometimes towards the north, sometimes towards the south: it may be said, however, that once out of the reach of the current of the MOZAMBIQUE Strait, which, from the 9th to the 12th of May, had set her to 103 miles to the southward, the ship was carried almost constantly to the northward till she reached the parallel of ST. HELENA. (*See* at the end of the NOTES, the *GENERAL TABLE* VIIIth Run.)

NINTH AND LAST RUN.

From the Island of ST. HELENA to the Strait of GIBRALTAR and to TOULON.

NOTE LXXV.

The SOLIDE had quitted the Road of ST. HELENA on the 5th of June, at half past ten o'clock in the evening. On the 6th at noon, the island bore from her from south-south-east 4° east to south-east by east 2° south; and from the observation of latitude and the dead reckoning, it was concluded that, from half past ten o'clock the preceding evening, she had advanced 7 minutes to the northward, and that the progress towards the west had been 5 minutes. But, in order to avoid the uncertainty of the dead reckoning, we shall

ſhall take the ſhip getting under way in the Road of St. Helena, on the 5th at half paſt 10 P. M. and her point of departure will be 15° 55′ 0″ ſouth latitude, and 8° 9′ 0″ longitude weſt from Paris (farther back, page 453). Thus the firſt obſervations of longitude having been made on the 10th of July, and reduced to noon on that ſame day, we ſhall reckon that, between the departure from St. Helena and the period of theſe obſervations, there had elapſed thirty-four days and a half, or more exactly, 34.56 days.

On the 10th of July, the mean reſult of four ſets of diſtances obſerved from the moon to the ſun, reduced to noon, gave for the longitude of the ſhip at that moment, 46° 27′; and on comparing it to that of St. Helena 8° 9′, it is ſeen that the ſhip's progreſs towards the weſt in the interval of thirty-four days and a half, had been 38° 18′.

The longitude deduced from the daily reckoning ſince the departure, was 43° 30′; thus the progreſs towards the weſt, according to the reckoning, was only 35° 21′: the reckoning was therefore in error, after a run of thirty-four days and a half, 2° 57′, or (by a mean parallel between that of the point of departure and that of the point arrived at) about 160 miles, which the ſhip had been carried to the weſtward beyond her apparent progreſs towards that ſide.

On examining, in the Journal of the Route, the effect of the currents in the direction of the latitude, we make the following remarks:

From 15° 55′ to 12° 21′ ſouth latitude, the currents carried the ſhip to the *Northward* 22 minutes, or 22 miles, in 4 days;

From 12° 21′ to 8° 29′, they carried the ſhip to the *Southward* 9 miles in 3 days:

From 8° 29′ to 6° 55′, no difference between the dead reckoning and the obſervations;

From 6° 55′ to 3° 8′, they carried the ſhip to the *Northward* 19 miles in 3 days;

From 3° 8′ to 0° 57′, to the *Southward*, 32 miles in 2 days.

On aſcending from the Equator towards the north, the currents conſtantly ſet to the *Northward*; their direction was only once towards the *South*, between the latitude of 21° 25′ and 23° 3′, and their effect 3 miles only in twenty-four hours: but I obſerve that at this period, from the 4th to the 5th of July, our navigators had, at noon, the ſun very near the zenith; and this accidental deviation of the currents towards the ſouth, might probably have been only apparent, and be the effect of ſome ſmall error in the obſervation; for with the exception of this ſingle day, ſince the ſhip had paſſed the line, the tendency of the currents had been conſtant towards the north, and their velocity had been conſiderable, as may be conceived in conſulting the JOURNAL OF THE ROUTE.

From 0° 57′ South to 0° 38′ North, 16 miles in 1 day:
From 0° 38′ North to 2° 34′ ..... 28 miles in 1 day:
From 2° 34′ ..... to 4° 34′ ..... 15 miles in 1 day:
From 4° 34′ ..... to 8° 15′ ..... 43 miles in 3 days:
From 8° 15′ ..... to 9° 21′ ..... no difference:
From 9° 21′ ..... to 11° 5′ ..... 22 miles in 1 day:
From 12° 20′ ..... to 13° 33′ ..... 9 miles in 1 day:
From 26° 0′ ..... to 27° 50′ ..... 21 miles in 1 day:
From 30° 5′ ..... to 32° 23′ ..... 13 miles in 1 day, &c.

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I have not made mention of the leſs conſiderable effects: theſe may be ſeen in the JOURNAL OF THE ROUTE.

If we recapitulate, on the one hand, all the quantities which the ſhip was carried to the *Northward* in exceſs of her apparent progreſs; and on the other, thoſe which ſhe was carried to the *Southward*, in defect of this ſame progreſs; we find that, in the courſe of the period of thirty-four days and a half, the ſum of the former was 242 miles, and that of the latter, 44 miles: ſubſtracting the ſmaller from the greater, we have 198 miles for the error which the ſhip would have had in latitude, if the error of each day had not been corrected by the obſervation.

At preſent, if we combine theſe 198 miles northing with the 160 miles weſting, we find that, in the interval of thirty-four days and a half, the currents carried the ſhip 255 miles to the north 39° weſt, or north-weſt 6° north, beyond her apparent run the direction of which, during that period, differed little from that of north-weſt.

It may therefore be concluded that, from ST. HELENA to the Point where the SOLIDE was arrived on the 10th of July (32° 23′ north latitude and 46° 27′ weſt longitude) the almoſt conſtant tendency of the currents was towards the north-weſt, and that their effect on the ſhip's run was, in increaſe of this run, 7.4 miles in twenty-four hours, which muſt be added to the apparent run in order to have the true progreſs.

NOTE LXXVI.

On the 23d of July, the reſult of the obſervations of that day, reduced to noon, placed the ſhip in longitude 34° 32′ weſt; and, on comparing this poſition

tion to that of the 10th at noon 46° 27′, we find that, in the interval of 13 days, the progreſs towards the eaſt was 11° 55′.

If we compare with each other the longitudes deduced from the dead reckoning, for the ſame periods, 32° 3′ on the 23rd, and 43° 30′ on the 10th, we ſhall find that, according to the reckoning, the progreſs towards the eaſt had been only 11° 27′: the difference between the apparent progreſs and the real progreſs was therefore 28 minutes, or 22.4 miles, which it appears that the currents carried the ſhip to the eaſtward.

The daily differences between the latitude by account and the latitude by obſervation in the courſe of the period, ſhewed that, 2 days excepted, the tendency of the currents was towards the north:

The firſt two days, they ſet to the northward 10 and 8 miles in twenty-four hours:

From the 13th to the 14th, 12 miles to the ſouthward in 2 days;

They reſumed their direction to the northward, from the 14th to the 21ſt, and in theſe ſeven days, they ſet towards that ſide, 5—10—9—5—2—0— and 6 miles a day.

But from the 21ſt to the 22d 8 miles to the ſouthward:

And laſtly from the 22nd to the 23rd no difference.

In deducting the 20 miles ſouthi ng from the 55 miles northing, there remains 35 miles which, in 13 days, the currents carried the ſhip to the northward beyond her apparent progreſs towards that ſide.

If

If we combine these 35 miles northing with the 22.4 miles easting, we find that the general direction of the currents was north 32° 30′ east, their effect, in 13 days, on the ship's way, 41⅓ miles, and mean effect, 3.2 miles in twenty-four hours.

NOTE LXXVII.

The result of the observations of the 24th of July confirms in general the result of those of the 23rd: for, on comparing the longitude observed on the 24th and reduced to noon, which is 32° 18′ with that of the 10th, which was 46° 27′, we find that the progress towards the east was 14° 9′; and according to the dead reckoning, which gave for the longitude on the 24th 29° 55′, and for the 10th 43° 30′, the apparent progress was only 13° 35′: the difference is therefore 34′, or 27.5 miles, which the currents carried the ship to the eastward in the interval of the 14 days.

It has been seen (preceding Note) that, from the 10th to the 23rd, a compensation having taken place, the ship had been carried 35 miles to the northward: if we thence take away 8 miles which she was carried to the southward, from the 23rd to the 24th there will remain 27 miles for the quantity which the ship was set to the northward from the 10th to the 24th.

On combining these 27 miles northing with the 27.5 miles easting, we find that the currents carried the ship 38½ miles in 14 days, or 2.75 miles in twenty-four hours, to the north 45° 30′ east *.

* The progress towards the east, from the 23rd to the 24th, is, according to the observations, 2° 14′; and according to the reckoning, 2° 8′: the difference is therefore 6 minutes, or 4.5 miles, which the progress by observation is greater. If we combine these 4.5 miles easting with the 8 miles, which the ship was carried to the southward through the effect of the current, we shall find that she appears to have been carried, in these 24 hours, 9.2 miles to the south 29½ east.

These

Theſe reſults differ ſo little between themſelves, with reſpect to the longitude that we ſhould be juſtified in relying on the correctneſs of the obſervations of the 23rd and 24th, which reciprocally ſerve as a proof to each other. We may therefore conclude that, during this period of 14 days, from the 10th to the 24th of July, the currents ſet to the eaſtward, 1.35 miles in twenty-four hours, by the obſervations of the 23rd and 1.95 miles by thoſe of the 24th; the mean time is $1\frac{2}{3}$ miles.

We ought not, as I have ſaid, to expect perfect accuracy from the reſults of lunar obſervations for determining the *ſmall* differences in longitude, and it can be obtained only from time-pieces or chronometers; but the former is ſufficient here for proving that the currents which, ſince the 6th of June, the time of the departure from St. Helena, had ſet to the weſtward, began on the 10th of this laſt month to ſet to the eaſtward, and continued to the 4th, to act on that ſame ſide. Let us obſerve that, on the 10th, the ſhip had already reached the latitude of 32° 30′ north, and although the ſhip was on a meridian about 600 leagues diſtant from that of the Strait, it would not be ſurpriſing that between the parallel of Cape Cantin, on the coaſt of Africa, 32° 30′, and that of Cape St. Vincent, on the ſouth coaſt of Spain 37°, which the Solide croſſed in her route from the 10th to the 24th of July, and which compriſe the great mouth of the Strait, the general movement of the waters, whoſe tendency ought to be towards the eaſt in order to flow afterwards into the Meditterranean *, began to be felt in the offing, at that diſtance of ſix hundred leagues.

* *See* the *Voyage de l'Iſis* in 1768, Vol. I. page 178 and 179, we find there, in a run from *Cadiz* to *Santa Cruz* in the Iſland of *Teneriffe*, the daily compariſon of the progreſs in longitude, ſuch as it was deduced from the dead reckoning, with the real progreſs, ſuch as it was determined by means of the time-keepers of *Ferdinand Berthon*; it is there ſeen that the effect of the current towards the eaſt diminiſhes gradually, in proportion as the ſhip approaches the tropic.

NOTE

NOTE LXXVIII.

The obſervations of the 27th of July, placed the SOLIDE, at noon, in 25° 32′ weſt from Paris: and as, by thoſe of the 24th ſhe was in 32° 18′, it was concluded that her progreſs towards the eaſt, in 3 days, had been 6° 46′.

According to the dead reckoning, it was 7° 20′: the ſhip had therefore been carried 34 minutes, or 25.5 miles to the weſtward.

In the interval from the 24th to the 27th, the ſhip was carried, on the firſt day, 2 minutes to the northward, and on the ſecond and third day, 5 and 6 minutes so the ſouthward: which gives for the 3 days, 9 miles ſouthing.

On combining theſe 9 miles with the 25.5 miles weſting, it will be found that the direction of the currents was weſt 19° 15′ ſouth, and its effect on the ſhip's way, 27.2 miles, or about 9 miles in twenty-four hours.

Here the direction of the currents appears to have changed: for it has been ſeen (preceding Note) that, from the 10th to the 24th of July, their tendency was towards the *Eaſt*; and from the 24th to the 27th they reſumed their courſe towards the *Weſt*, as they had ſet from the 5th of June to the 10th of July. This return towards the weſt would, at firſt ſight, ſeem to contradict what I have before advanced, that the SOLIDE might have experienced at a very great diſtance in the offing, the ſetting of the currents towards the eaſt; but to prove that there is no contradiction in this, it will be ſufficient for me to obſerve that the ſhip was in two different poſitions, relatively to the STRAIT OF GIBRALTAR, which determines this ſetting of the currents towards the eaſt:

eaſt: in the former period, from the 10th to the 24th of July, ſhe had croſſed the parallels compriſed between 32° 30′ and 37°, which are thoſe which comprehend the great mouth of the Strait; but, from the 24th to the 27th, ſhe had ſailed between thoſe of 41° 40′ and 41° 20; there ſhe was 3 or 4° to the northward of the higheſt parallel where the movement of the waters towards the eaſt can ſtill be felt, more northerly by 2° than the parallel of the moſt northern of the WESTERN Iſlands; and in this poſition, ſhe may have met with currents whoſe direction was towards the weſt, and which carried her towards that ſide. Therefore there is no contradiction.

NOTE LXXIX.

On the 2d of Auguſt, at noon, Cape ST. VINCENT, on the coaſt of PORTUGAL, bore eaſt half ſouth, at the diſtance of two leagues and a half eſtimated by the eye: the ſhip was therefore more to the northward than this Cape, by 0.75 miles, and more to the weſtward by 7.45 miles, or 9 minutes and 20 ſeconds.

According to the obſervations of BORDA in 1776:

Cape ST. VINCENT { Latitude .... 37° 2′ 20″ north;
Longitude ... 11° 21′ 36″ weſt.

Thus, according to the bearings, this ought to be

For the SOLIDE ..... { Latitude .. 37° 3′ 5″;
Longitude 11° 30′ 56″.

The

The latitude was obſerved on board the ſhip, in 37° 2′: difference in defect 1′ 5″.

The lunar obſervations made on board the SOLIDE had given for the longitude of the 27th of July at noon (preceding *Note*) 25° 32′: if we thence deduct the progreſs by account towards the eaſt in the interval from the 27th of July to the 2nd of Auguſt at noon, which was 12° 35′, there will remain, for the longitude of the ſhip at the latter period, 12° 57′. But, according to the bearing of the land, it ought to be only 11° 30′ 56″: thus, in the interval from the 27th of July to the 2d of Auguſt, in 6 days, ſhe had been carried to the eaſtward or *ahead* of the apparent progreſs, 1° 26′ 4″, or 66.5 miles.

In the firſt two days of the period, the latitude by account had agreed with that by obſervation; but from the 29th to the 31ſt, the currents ſet the ſhip to the ſouthward 20 miles, and 12 miles from the 1ſt to the 2nd: in all, 32 miles in 6 days.

This movement of the waters towards the ſouth cannot be matter of ſurprize at the beginning of Auguſt: the melting of the ice and ſnow of GREENLAND, ICELAND, LAPLAND, NORWAY, &c. neceſſarily produce towards the ſouth, an accidental current which muſt carry towards that ſide the ſhips that have reached the parallels ſituated above the northern tropic, beyond which the general movement of the waters from eaſt to weſt diminiſhes gradually in proportion as the latitudes are higher, and end by being abſolutely imperceptible two or three degrees north of the tropic.

In the poſition where the SOLIDE was, at the latter end of July and the beginning of Auguſt, out of the limits of the general current of the tropics, ſhe muſt have yielded to two cauſes which combined for driving her from her ap-

parent course; to the southerly current, produced by the melting of the ice, and to the easterly current, which occasions the tendency of the waters towards the STRAIT OF GIBRALTAR.

If we combine the effects resulting from these two causes, 66.5 miles easting and 32 miles southing, we find that the ship was carried 74 miles, in the interval of 6 days, or 12.3 miles in twenty-four hours, in the direction of east 25° 30′ south.

NOTE LXXX.

On the 4th of August, at five o'clock in the morning, Capt. SPARTEL, (on the coast of AFRICA) bore south-east, estimated distance $2\frac{1}{2}$ miles.

According to the observations of BORDA, in 1776:

Cape SPARTEL .... { Latitude .... 35° 49′ 20″ north;
Longitude ... 8° 14′ 00″ west.

The ship, according to the bearing, was more to the northward than the cape by 1.6 miles, or 1′ 40″, and more to the westward by 1.6 miles or 2 minutes.

Thus, for the SOLIDE { Latitude .... 35° 49° 00″;
Longitude ... 8° 16′ 00″.

If, at present, we compare this longitude of the ship, on the 4th of August, at five o'clock in the morning, to her true longitude, on the 2nd at noon, in sight of Cape ST. VINCENT, which was (preceding *Note*) 11° 30′ 56″; it is

ſeen that, in the interval of 1 day 17 hours, the real progreſs towards the weſt had been 3° 15′; and according to the reckoning, the apparent progreſs was only 2° 38′: thus, in the interval of 41 hours, the ſhip had been carried to the eaſtward, by the movement of the waters, 0° 37′, or 30 miles beyond her apparent progreſs: this is at the rate of upwards of 17½ miles in twenty-four hours. The cauſe of this current is too well known, for it to be neceſſary to recall it to mind. (*See* at the end of the *Notes* the *General Table*, ixth Run.)

The errors of the dead reckoning in longitude in the laſt Run from the Iſland of St. Helena to the Strait of Gibraltar, are aſſembled in the following Table.

		The Ship advancing towards the Weſt, Errors of the Reckoning.		The ſhip advancing towards the Eaſt, Errors of the Reckoning.	
		Aſtern.	*Ahead.*	*Aſtern.*	*Ahead.*
June From the 5th July to the 10th	In 34½ Days..	2° 57′			
From the 10th to the 23d.	In 13		.....	0° 28′	
From the 23rd to the 24th	In 1		.....	0° 6′	
From the 24th to the 27th	In 3		.....	.....	0° 37′
From the 27th August to the 22d.	In 6		.....	1° 26′	
From the 2nd to the 4th.	In 2		.....	0° 37′	

Minus

Minus West.....			2.57
Minus East....	2° 34′	Difference	East 2. 3
Plus East....	0° 37′		
Sum of the errors of the Reckoning in 59½ days,			*Astern* 5.00

This sum of errors is reduced by the effect of compensations, to 0° 54′ to the eastward, or *ahead*, with respect to the MEDITERRANEAN towards which the ship was directing her course.

The SOLIDE passed the STRAIT OF GIBRALTAR on the 4th of August, and on the 14th she anchored in the road of TOULON. As this Run up the MEDITERRANEAN neither gave occasion for any observation nor for any remark, I refer the Reader, for the last ten days of the voyage, to the *JOURNAL OF THE ROUTE* which is to be found at the end of the *TABLE OF THE EFFECT OF THE CURRENTS.*

TABLE

OF THE EFFECT OF THE CURRENTS

On the Course and Rate of sailing of the Solide, according to the Obſervations of Latitude and Longitude, made on board the Ship in the Courſe of her Voyage Round the World, in 1790, 1791, *and* 1792.

The firſt column ſhews the Periods of the Obſervations the Reſults of which are compared with thoſe of the *Reckoning*, or the calculation of the ſhip's run at the ſame periods.

The 2nd and 3rd preſent the Latitude and Longitude obſerved at the extreme limits of each Period, in order that the Reader may be able to judge at firſt ſight between what Parallels and what Meridians the ſhip experienced the various effects of the Current ſpecified in the *Table*.

The 4th—5th—6th—and 7th Columns give the difference that was found in comparing the progreſs in latitude, and the progreſs in longitude with the progreſs, in both directions, ſuch as they were deduced from the daily obſervation of latitude and from the obſervations of longitude, made at the two extreme limits of the period: theſe are the errors that were found in the reſults of the *Dead Reckoning* compared with thoſe of the *Obſervations*. Thus, for example, when you read (IInd. Run, Period from the 16th to the 25th of February 1791): 67 miles ſouth and 94.2 miles weſt; theſe expreſſions ſignify that, in the interval from the firſt to the laſt day of the Period, the ſhip was carried to the ſouthward 67 miles more than was indicated by the ſum of the daily progreſs in latitude deduced from the ſimple reckoning; and that the

progreſs

progreſs towards the weſt, in the ſame interval, was greater by 94.2 miles according to the Reſults of the obſervations for the longitude, made at the two extreme limits of the Period, than it would have been in adding up the ſum of the progreſſes, which was daily deduced every day from the reckoning: and, in attributing to the effect of the currents theſe differences between the reſults of the *Dead Reckoning*, and thoſe of the *Obſervations*, we ſay that the Currents ſet to the ſouthward and to the weſtward, quantities expreſſed by theſe differences.

For forming the 8th—9th—10th and 11th Columns, I have combined the effect which is attributed to the current in the direction of the latitude, with that which is attributed to it in the direction of the longitude: and if it be wiſhed to continue the preceding example, it will be found (8th Column) that the current which occaſioned a difference or error to the ſouthward, of 67 miles, and another error to the weſtward of 94.2 miles, carried the ſhip to the weſt 36 degrees ſouth; and that by an imperceptible movement (9th Column), it occaſioned her to make, in that direction 115.7 miles, which could not be accounted for by the *Dead Reckoning*.

By then dividing this laſt number by 9, the number of days of the Period (10th Column) it is found that the mean progreſs of the ſhip, in the direction mentioned in the ninth column, was 12.8 miles in twenty-four hours (11th Column).

The Twelfth refers to the *Notes*, in which are detailed the operations of the calculation that has led to the reſults preſented in the *Table*; and the *Data* of the calculation are to be found in the *Journal of the Route* printed at the end of this *Table*.

FIRST

FIRST RUN.

From the STRAIT OF GIBRALTAR *to the* CAPE DE VERD *Islands.*

PERIODS.	Latitude observed NORTH.	Longitude observed WEST.	DECOMPOSED EFFECT according to the Obſervations. N.	S.	E.	W.	COMPOUND EFFECT On the Courſe.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Rhumb.*	*Miles.*	*Days.*	*Miles.*	*Numb.*
1790. *Decem.* From 29	In ſight of Cape *Spartel.* 35 52	8 14									
1791. *January* to 5	30 08	18 38	....	9	38	....	E. 13° ½ S	39	7	5,8	I. and II.
From 5 to 9	30 08 / 21 24	18 38 / 21 46	....	12	49	....	E. 13° ¾ S.	50,5	4	12,6	III.
From 9 to 14	21 24 / 15 02	21 46 / 25 29	....	18	....	30,	W. 30° ¾ S.	35,5	5	7,1	IV.

SECOND RUN.

From the CAPE DE VERD *Islands to within ſight of* STATEN LAND.

From 18	At *La Praya.* 14 53	25 51	....	....	....	....	.....	.....	....	.....	V.
to 28	3 36	20 35 by account.									
to 31	2 26	21 29 by account.	50	....	(*)	(*)	North.	50	3	16,6	
From 18 *February* to 6	14 53 / SOUTH. 5 38	25 51 / 27 58	81	....	....	62	N. 37° W.	103	19	5,4	VI.
From 6 to 9	5 38 / 10 43	27 58 / 31 08	....	9	....	29,7	W. 28° S.	31	3	10,3	VII.
From 9 to 12	10 43 / 16 10	31 08 / 33 41	....	24	....	21,4	W. 48° ½ S.	32,2	3	10,7	VIII.
From 12 to 15	16 10 / 18 53	33 41 / 35 56	....	29	....	....	W. 42° ½ S.	42,9	3	14,3	IX.

(*) In the interval from the 28th to the 31ſt, the currents, according to the obſervations of latitude, between the parallels of 3°36′ and 2°26′, and between 20° 30′ and 21° 30′ of longitude, had ſet 50 minutes to the northward; but as, ſince the departure from *La Praya*, on the 18th, no obſervation of longitude was made, we are ignorant whether, during the ſame time, they ſet towards the Eaſt or the Weſt: the obſervations made on the 18th of January, and on the 6th of February, lead us to preſume that they muſt have ſet to the weſtward.

Periods.	Latitude observed SOUTH.	Longitude observed WEST.	DECOMPOSED EFFECT according to the Observations. N.	S.	E.	W.	COMPOUND EFFECT On the Course.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	Miles	Miles	Miles	Miles.	Rhumb.	Miles.	Days.	Miles.	Numb.
1791. *February.* From 15 to 16	18 .53 20 01	35 56 37 06	....	10	....	24,5 or 14,0	W. 22° ½ S. or W. 36° S.	26,5 or 17,8	1	26,5 or 17,8	X.
From 16 to 25	20 01 31 45	37 06 47 56	....	67	....	94,2	W. 36° S.	115,7	9	12,8	XI.
From 25 to 26	31 45 32 30	47 56 48 23	....	22	0	0	South	22	1	22,	Ditto.
From 26 *March* to 8	32 30 36 48	48 23½ 48 06	80	....	187,5	....	E. 23° N.	204,0	10	20,4	XII.
From 8 to 10	36 48 38 44	48 06 53 16	....	29,0	....	11,0	S. 20° ¾ W.	31,0	2	15,5	XIII.
From 10 to 11	38 44 40 03	53 16 55 51	....	38,0	....	34,0	S. 42° W.	51,0	1	51,0	Ditto.
From 11 to 12	40 03 40 48	55 51 56 28	4,0	....	18,5	....	E. 12° ½ N.	18,6	1	18,6	Ditto.
From 12 to 15	40 48 40 59	56 28 57 46	23,0	....	....	0,76	N. 1° $\frac{1}{5}$ W.	23,0	3	7,6	Ditto.
From 15 to 23	40 59 43 26	57 46 62 15	60,0	....	58,4	....	N. 44° ¼ E.	83,75	8	10,4	XIV.
From 23 to 25	43 26 43 55	62 15 63 23	11,0	....	....	36,0	W. 13° ¼ N.	37,0	2	18,5	XV.
From 25 to 27	43 55 47 03	63 23 64 48	....	2,0	32,2	....	E. 3° ½ S.	32,3	2	16,1	XVI.
From 27 to 28	47 03 47 55	64 48 65 08	5,0	....	2,5	....	N. 26° ½ E.	5,6	1	5,6	XVII.
From 28 to 30	47 55 51 06	65 08 67 41	....	22,0	....	....	South.	22,0	2	11,0	XVIII.
From 30 *April* to 1	51 06 53 56	67 41 66 08	12,0	....	30,8	....	E. 17° ½ N.	33,25	2	16,6	XIX.
From 25 *M* to 1 *A.*	43 55 53 56	63 23 66 08	....	7,0	65,5	....	E. 6° ¼ S.	66,0	7	9,5	Ditto

THIRD RUN.

From STATEN LAND *to the* MARQUESAS DE MENDOÇA.

Periods.	Latitude observed south.	Longitude observed west.	Decomposed effect according to the Observations. N.	S.	E.	W.	Compound effect. On the Course.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Rhumb.*	*Miles.*	*Days.*	*Miles.*	*Numb.*
1791. *April.* From 1 to 11	In sight of Cape *San-Juan.* 53 56 / 59 44	66 08 / 77 03	28,0	....	68,6	....	E. 22° ½ N.	73,5	10	7,4	XX.
From 11 to 19	59 44 / 52 33	77 03 / 93 19	....	80,0	....	71,5	S. 41° ¾ W.	107,5	8	13,4	XXI.
From 19 to 25	52 33 / 46 08	93 19 / 95 46	....	17,0	....	0,65	S. 2° ¼ W.	17,02	6	2,8	XXII.
From 25 *May.* to 9	46 08 / 30 02	95 46 / 96 48	15,0	....	93,0	....	E. 9° ¼ N.	95,25	14	6,8	XXIII.
From 9 to 12	30 02 / 28 25	96 48 / 98 51	....	10,0	....	7,0	S. 34° ¾ W.	12,2	3	4,0	XXIV.
From 12 to 23	28 25 / 23 05	98 51 / 111 56	....	52,0	....	173,0	W. 16° ¾ S.	180,5	11	16,4	XXV.
From 23 to 27	23 05 / 19 32	111 56 / 116 34	....	26,0	....	54,0	W. 23° ½ S.	59,0	4	14,75	XXVI.
From 12 to 27	28 25 / 19 32	98 51 / 116 34	....	78,0	....	228,0	W. 18° ¾ S.	242,0	15	16,0	Ditto.
From 27 *June.* to 6	19 32 / 12 10	116 34 / 127 10	....	....	....	12,5	West.	12,5	10	1,25	XXVII.
From 6 to 7	12 10 / 11 12	127 10 / 129 25	....	3,0	....	0,98	S. 16° ½ W.	3,13	1	3,13	Ditto.
From 7 to 8	11 12 / 10 18	129 25 / 131 08	....	1,0	8,8	....	E. 6° ½ S.	8,87	1	8,87	Ditto.
From 8 to 10	10 18 / 9 54	131 08 / 135 52	....	7,0	....	52,0	W. 7° ½ S.	52,66	2	26,3	XXVIII.
From 10 to 12	9 54 / 9 59	135 52 / 140 29	....	15,0	....	65,0	W. 12° ¾ S.	67,25	2	33,67	XXIX.

FOURTH RUN.

From the MENDOCA *Islands to the* NORTH-WEST *Coast of* AMERICA.

Periods.	Latitude observed SOUTH.	Longitude observed WEST.	DECOMPOSED EFFECT according to the Obſervations. N.	S.	E.	W.	COMPOUND EFFECT On the Courſe	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Rhumb.*	*Miles.*	*Days*	*Miles.*	*Numb.*
1791. *June.*	At *La Madre de Dios.*										
From 20	9 55½	141 29	....	....	....	....	.....	.....	....	.....	XXX.
to 22	9 21	142 27	....	....	2,96	....	East.	2,96	1½	1,97	XXXI.
From 22	9 21	142 27	....	6,0	....	6,9	W. 41° S.	9,1	2	4,56	XXXII.
to 24	7 54	143 10									
From 24	7 54	143 10	12,0	....	....	17,8	W. 33° ¾ N.	21,5	1	21,5	XXXIII.
to 25	5 42	143 49									
	SOUTH.										
From 25	5 42	143 49	114,0	....	....	101,2	N. 41° ¾ W.	152,8	25	6,1	XXXIV.
July	NORTH.										
to 20	28 42	156 02									

On correcting the error of the ſand-glaſs which meaſured time while the log was meaſuring the ſhip's way through the water, we ſhould have :

	SOUTH.										
From 25	5 42	143 49	58,0	....	....	43,0	N. 36° ½ W.	72,3	25	2,9	Ditto.
July	NORTH.										
to 20	28 42	156 02									
From 20	28 42	156 02	11,0	....	....	2,6	N. 13° ¼ W.	11,3	3	3,76	XXXV.
to 23	32 10	154 25									
From 23	32 10	154 25	21,0	....	....	1,67	N. 4° ½ W.	21,0	1	21,0	XXXVI.
to 24	34 05	153 32									
From 24	34 05	153 32	15,0	....	....	13,6	N. 42° ½ W	20,25	2	10,12	XXXVII.
to 26	37 49	152 17									
From 26	37 49	152 17	54,0	....	43,9	....	N. 39° ⅗ E.	69,25	10	7,0	XXXVIII.
August											
to 5	35 12	143 46									
From 5	55 12	143 46	25,9	....	....	....	North.	25,9	2¼	11,5	XXXIX.
to 7	57 18	139 26½									

At 6 P. M. at the Point whence Cape *del Engaño* was ſet.

FIFTH RUN.

From the NORTH-WEST *Coast of* AMERICA *to the* SANDWICH *Islands.*

Periods.	Latitude observed North.	Longitude observed West.	Decomposed effect according to the Observations: N.	S.	E.	W.	Compound effect: On the Course.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	Miles.	Miles	Miles	Miles.	Rhumb.	Miles.	Days.	Miles.	Numb.
1791. *August.* From 21	In *Tchinkîtânay* Bay.										
to 22	57 04 54 35	137 59 137 10	....	3,0	3,3	....	E. 42° ½ S.	4,5	1	4,5	XL.
September. From 1	In sight of *Queen Charlotte*'s Island.										
to 4	52 56 49 01	135 35 130 40	....	7,0	12,0	....	E. 30° ½ S.	14,0	3	4,6	XLII. and XLIII.
From 8	In sight of *Berkley-Sound.*										
to 19	48 46 30 58	128 48 139 03	....	126,0	83,6	....	S. 33° ¼ E.	151,5	11	13,77	XLIV. and XLV.
From 19 to 21	30 58 29 46	139 03 141 33	....	8,0	....	11,2	W. 35° ½ S.	13,8	2	6,9	XLVI.
From 21 to 23	29 46 28 30	141 33 143 47	....	....	....	5,22	West.	5,22	2	2,6	XLVII.
From 23 to 30	28 30 21 02	143 47 149 27	....	3,0	18,0	....	E. 10° S.	18,3	7	2,6	XLVIII.
From 30 *October* to 1	21 02 19 41	149 27 150 59	....	5,0	0,93	....	S. 10° ½ E.	5,1	1	5,1	XLIX.
From 1 to 3	19 41 19 14	150 59 155 07	....	3,0	....	7,53	W. 21° ¾ S.	8,1	2	4,0	L.
From 3 to 4	19 14 19 06	155 07 157 10¼	4,0	....	....	8,66	W. 24° ¾ N.	9,6	1⅙	8,2	LI.
At 4 P. M. on the meridian of the East point of *O-Whyhee.*											

SIXTH RUN.

From the SANDWICH *Islands to* MACAO.

Periods.	Latitude. observed NORTH.	Longitude observed WEST.	DECOMPOSED EFFECT according to the Obſervations. N.	S.	E.	W.	COMPOUND EFFECT On the Courſe.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Rhumb.*	*Miles.*	*Days.*	*Miles.*	*Numb.*
1791. *October.* From 7 (6 P. M.) to 19	In ſight of the Iſland of *O-Whyhee.* 19 04 / 13 33	158 29 / 178 48	....	12,0	....	81,5	W. 8° ⅓ S.	82,5	11¾	7,0	LII and LIII.
From 19 to 20	13 33 / 13 32	178 48 EAST. / 179 41	....	....	....	5,8	Weſt.	5,8	1	5,8	LIV.
From 20 to 23	13 32 / 13 40	179 41 / 172 33	....	....	....	72,0	Weſt.	72,0	3	24,0	LV.
From 23 *Novem.* to 2	13 40 / 14 26	172 33 / 148 14	3,0	....	....	97,0	W. 1° ⅔ N.	97,0	10	9,7	LVI.
From 2 to 4	14 26 / 14 50	148 14 / 144 13	4,0	....	21,25	....	E. 11° N.	21,75	2	10,87	LVII.
From 4 to 16	14 50 / 21 34	144 13 / 122 06	21,0	....	....	126,25	W. 9° ½ N.	128,0	12	10,66	LVIII.
From 16 to 18	21 34 / 21 48 In ſight of the S. W. Point of the Iſland of *Formoſa.*	122 06 / 118 28	17,0	....	....	3,72	N. 12° ½ W.	17,4	2	8,7	LIX.

SEVENTH RUN.

From MACAO *to the Isle of* FRANCE.

N. B. For the effect of the *Currents*, I refer the Reader to the Narrative itſelf, under the dates of the 15th, 18th, 19th, and 25th of December, Vol. II, pages 91, 94 to 100, 111 and following; and to NOTE LX, farther back, page 325.

EIGHTH RUN.

From the Isle of Réunion *to* St. Helena.

1. From the Isle of Réunion to the Coast of Africa.

Periods.	Latitude observed South.	Longitude observed East.	Decomposed effect according to the Observations. N.	S.	E.	W.	Compound effect On the Course.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Rhumb.*	*Miles.*	*Days*	*Miles.*	*Numb.*
1792. *April.* From 21	In sight of the Isle of *Réunion.*										
to 28	20 48 27 11	53 08 42 44	....	23,0	....	115,5	W. 11° ½ S.	117,2	6 ⅔	17,57	LXIII.
From 28 to 29	27 11 27 50	42 44 39 22	7,0	....	....	21,25	W. 18° ½ N.	22,25	1	22,25	LXIV.
From 29 *May* to 9	27 50 In sight of the Coast of *Africa.* 33 33	39 22 25 57	....	73,0	....	51,5	S. 35° ¼ W.	89,3	10	9,0	LXV.

2. From within Sight of the Coast of Africa to the Island of St. Helena.

From 9(*) to 12	33 33 35 00	25 57 21 49	....	103,0	....	147,4	W. 35° S.	180,0	3	60,0	LXVI.
From 12 to 13	35 00 34 38	21 49 21 01	17,0	....	....	2,45	N. 8° ½ W.	17,2	1	17,2	LXVII.
From 13 to 15	34 38 35 19	21 01 19 57	3,0	....	14,7	....	E. 12° ⅓ N.	15,2	2	7,6	LXVIII.
From 15 to 16	35 19 35 44	19 57 17 47	....	9,0	1,6	....	S. 10° E.	9,2	1	9,2	LXIX.
From 16 to 25	35 44 25 28	17 47 4 42	40,0	....	....	56,5	W. 35° ½ N.	69,3	9	7,7	LXX.
From 25 to 18	25 28 22 06	4 42 0 58	35,0	....	....	62,5	W. 27° ⅓ N.	71,5	3	23,8	LXXI.

(*) See the *Narrative*, Vol. II, at the date of the 12th of May, 1792.

Periods.	Latitude observed South.	Longitude observed West.	Decomposed effect according to the Observations. N.	S.	E.	S.	Compound effect On the Course.	On the Rate of Sailing.	Duration of the Period.	Mean Drift in One Day.	Reference to the Notes.
	° ′	° ′	Miles.	Miles.	Miles.	Miles.	Rhumb.	Miles.	Days.	Miles.	Numb.
1792. *May.* From 28	22 06	East. 0 58	....	....	....	7,27	West.	7,27	1	7,27	LXXII.
to 29	20 52	West. 0 15									
From 29 to 30	20 52 19 13	0 15 1 43	6,0	....	0,94	....	N. 8° ½ E.	6,1	1	6,1	LXXIII.
From 30 *July* to 3	19 13 In sight of *St. Helena.* 15 49	1 43 7 27	33,0	....	....	....	North.	33,0	4	8,25	LXXIV.

NINTH AND LAST RUN.

From the Island of St. Helena *to the Strait of* Gibraltar *and to* Toulon.

From 5 *July* to 10	*St. Helena* Road. 15 55 North. 32 23	8 09 46 27	198,0	....	....	160,0	N. 39° W.	255,0	34½	7,4	LXXV.
From 10 to 23	32 23 41 42	46 27 34 32	35,0	....	22,4	....	N. 32° ½ E.	41,6	13	3,2	LXXVI.
From 23 to 24	41 42 41 42	34 32 32 18	....	8,0	4,5	....	S. 29° ⅓ E.	9,2	1	9,2	LXXVII.
From 24 to 27	41 42 41 13	32 18 25 32	....	9,0	....	25,5	W. 19° ¾ S.	27,2	3	9,0	LXXVIII.
From 27 *August* to 2	41 13 In sight of Cape *St. Vincent.* 37 03	25 32 11 31	....	32,0	66,5	....	E. 25° ½ S.	74,0	6	12,3	LXXIX.
From 2 to 4 5h P. M.	From within sight of Cape *St. Vincent,* 37 03 to within sight of Cape *Spartel,* 35 49	11 31 8 16	....	....	30,0	..	East.	30,0	1¾	17,5	LXXX.

For the Run from the Strait of Gibraltar to Toulon, where the Solide anchored on the 14th of August, *see* the Journal of the Route.

Paris, 20th of Germinal, year V. of the French era.
9th of April, 1797.

ADDITIONS

TO THE RESULTS OF THE OBSERVATIONS,

FOR THE LATITUDE AND LONGITUDE,

For the Analysis of the general Chart of the two Straits situated between the Island of BANCA *and that of* BILLITON. *(Farther back,* Note LXII. *pages* 345 *to* 444*).

THIS Analysis had been printed several months, and the general Chart, as well as the particular Chart of the STRAITS, had been engraved, before I had an opportunity of procuring the new Edition (*London*, 1791) of a Memoir of GEORGE ROBERTSON, entitled: *A short Account of a Passage from China*, &c.† with the new Edition of his Chart and of his Plan of the same STRAITS, the first of which had appeared in 1788.

1. On examining the corrections which ROBERTSON has made in his copper-plates (for they are the same), it appears that he has entirely changed the part of the Island of BANCA, comprised between Point PESANT and the

* We have thought that these Additions which, in the Original, are at the end of Vol. II. because they were not written till after the impression was completed, would with more propriety be placed at the end of the RESULTS OF THE OBSERVATIONS, to which they serve as a Supplement. —*Translator.*

† A short Account of a Passage from *China*, late in the season; down the *China* Seas, through the Southern *Natuna* Islands, along the Coast of *Borneo* through the Straits of *Billiton* (or *Clements' Straits*) to the Straits of *Sunda*, &c. *2nd Edition. London.* 1791. 4to.

Point which he names the NORTH-EAST POINT, and which I have called the EAST Point of BANCA. He has placed on this portion of the eaſt coaſt of the iſland, three ſmall iſlands on which it is ſaid that the VANSITTART was loſt; and $6\frac{1}{2}$ miles to the north-north-eaſt of the middle of theſe iſlands, ROCKS or BREAKERS near which are found 6 fathoms water. Although his chart and mine give to theſe iſlands (which were not laid down in his firſt edition) poſitions which differ from each other; it appears, however, that they are the ſame that were ſet from the SOLIDE's anchorage in 14 fathoms: but ROBERTSON carries them nearer to the main land of BANCA than they appeared to be from the point whence the SOLIDE's bearings of them were taken. The new ſhoal which he lays down to the north-north-eaſt of theſe iſlands, appears to be alſo one of the four between which the MASCARIN paſſed in 1773, and the SOLIDE in 1791, and part of which had been ſeen, in 1784, by the SULIVAN.

2. ROBERTSON has added a ſhoal, under the name of VANSITTART ROCK, which he places at the diſtance of 29 miles to the north-weſt of GASPAR Iſland, in latitude 2° 9′. I have, on my chart, a ſhoal ſeen by Captain CROZET in the MASCARIN in 1773 (Poſition doubtful) at the diſtance of 28 miles to the weſt-north-weſt of GASPAR: it appears that the diſtances are the ſame within a mile, but the bearings differ by two Points. The VANSITTART Rock is ſituated in the latitude of 2° 9′ on ROBERTSON's Chart, and that of CROZET is in 2° 9′ 30″: the latitudes would therefore be the ſame, if we ſuppoſed that, on the Engliſh chart, the ſhoal was laid down according to an *obſerved* latitude, and that its poſition was not ſubjected by Bearings to that of GASPAR; for ROBERTSON having placed this iſland in 2° 30′, while the obſervations and the Charts of COOPER, WILSON, MARCHAND, CHANAL, &c. (farther back, pages 352 to 357) place it in 2° 21′, that is 9 minutes leſs to the ſouthward, the ſame difference ought to be found in the latitudes of the ſhoal,

ſhoal, if, in fact, the two ſhoals be the ſame: but if, in order to preſerve this difference of 9 minutes which exiſts in this quarter, between ROBERTSON's latitudes and thoſe which I have thought it proper to prefer, CROZET's ſhoal be carried on my chart to the latitude of 2° 0′, and the diſtance to GASPAR, of from 28 to 29 miles, common to the two charts, be employed, the ſhoal will be placed nearly to the north-weſt of GASPAR, as on ROBERTSON's chart.

ROBERTSON confirms by a Note written on his chart, in the corrected part of the Coaſt of BANCA, what I have ſaid (farther back, page 418), from the opinion of the Captain of the SULIVAN, that in ſailing along this coaſt, ſhips ought not to come nearer the ſhore than 15 fathoms.

The WARREN HASTINGS's *Shoal*, which was not mentioned on ROBERTSON's old Charts, is laid down on the Chart and the Plan of the ſecond Edition; and it is placed, very nearly, in the poſition which I have aſſigned to it on my Chart, and which is very different from that which LARKINS, Captain of the WARREN HASTINGS, had given it on his: I have expoſed at ſome length the trigonometrical operations that determined a change which had appeared to me indiſpenſable. (Farther back, pages 358 to 363; and for the figure *PLATE* VII.)

3. Another correction, and this is the laſt which the new edition of ROBERTSON's Chart and Plan preſents, is the addition of a large rocky ſhoal or ledge, under the name of the VANSITTART's SHOAL, ſituated (at its middle) to the ſouth-eaſt by eaſt of the SOUTH-EAST Point of the Peninſula of SEL and 17 miles from this Point. It is placed on my Chart, according to the bearings which are mentioned by ROBERTSON, in his *Short Account*, &c.

page 10. I cannot do better, for the information of French navigators, than preſent to them a tranſcript of it:

" The bearings of this dangerous ſhoal are as follow *:

" 1. The Peak of SADDLE ISLAND (or L'ILE AUX MAMMELLES) in one with the centre of the SHOAL North 28° eaſt; at the ſame time SHOAL-WATER ISLAND (or L'ILE DE LA RECONNOISSANCE) South 43° eaſt;

" 2. By another bearing, the South-weſt extreme of it bears in one with the Peak of SADDLE ISLAND, North 33° 15′ eaſt, SHOAL-WATER Iſland South 45° 50′ eaſt.

" By theſe croſs-bearings it lies ſouth a little weſterly from SANDY ISLAND (on my Chart, SANDY BEACH Iſland); and in latitude, according to Captain CUMMING, 3° 12′ ſouth †."

* The bearings were not taken by *Robertſon* who does no more here than report them. It is very probable that the iſland *the neareſt to the Shoal* was ſet; and on *Robertſon*'s Chart and Plan, this iſland would be his *Low Iſland:* for I have remarked (farther back, page 389) that he has tranſpoſed the names of the two iſlands to the ſouth-eaſt of the weſt group. But it appears beyond a doubt that it is of our *Ile aux Mammelles*, *Cooper's Saddle* Iſland, the ſouthernmoſt of the two iſlands, that the bearing was taken, ſince the Peak is mentioned, which implies a ſecond elevation, as in *Saddle* Iſland, and cannot be applied to a low, flat iſland. Moreover, whichever of the two iſlands *Robertſon* meant, as they bear in one with each other, with reſpect to the poſition to be fixed, there is no error to be dreaded.

† *Robertſon*, on his Chart, gives this latitude to the north extremity of the ſhoal; which places its middle in 3° 14 or 15′, and gives it about 6 miles extent. The middle is on my Chart in 3° 6′; but it has been ſeen that, in general, my latitudes are leſs ſoutherly by 9 minutes, than thoſe of *Robertſon*. I have ſubjected the ſhoal to the bearings of the ſmall iſlands of *Clements'* Strait, which I have mentioned above; and it is placed, on my Chart, according to the bearing and diſtance at which it is laid down on *Robertſon*'s Chart, relatively to *Sandy Beach* Iſland, without attending to *Cummings*'s latitude: it is not mentioned whether this latitude was obſerved on the very parallel of the ſhoal, or whether it was obtained from a bearing reduced to the point where the obſervation was taken: however, what is of importance is to place it in the poſition which it ought to have in regard to the ſmall iſlands that form the Paſſages of *Clements'* Strait; and this is what I have done.

For

For Clements' Straits.

Robertson, page 5 of his *Short Account*, adds a few remarks to those which I have mentioned (farther back, pages 438 to 441) for the information of navigators who intend to pass through Clements' Strait.

" Of all the different passages between Middle and Long Island," says he, " that the fleet came through is by far the widest and best, and what I " would advise ships to take, in preference to any other, between Banca and " Billiton *; the Passage is between North and South Islands on one " hand, and Saddle Island, which forms an appearance of a saddle both " when to the northward and southward of it, on the other.

" The best track to keep is mid-channel, or nearly so, between the afore- " said islands, in order to avoid a sunken rock, which is about the size of " two long-boats, on which there is only one half fathom, and no appearance

* I am entirely of *Robertson*'s opinion when he says that, for ships which intend to take *Clements'* Strait, the best passage is between *North* and *South* Islands, on the east side, and *Saddle* Island and others on the west side; this is the passage of Captain *Clements*, and I think it preferable to that of the *Atlas*, Captain *Cooper*, and to that of the *Royal Admiral* (See their tracks marked on the charts, which passed between *Sandy-Beach* and *Button* Islands, and *Middle* Island); but I am not of *Robertson*'s opinion, when he says that *Clement's Passage* should be taken *in preference to any other between Banca and Billiton*. I think that, if he had used *Gaspar* Strait, between *Middle* Island and *Banca*, as the *Sulivan*, Captain *Stephen Williams*, as the *Triton*, and the *Provence*, Captain *Dordelin*, in coming from the southward, and afterwards, in going to the northward, as the *Carnatic*, Captain *Wilson*, the *Warren Hastings*, Captain *Larkins*, the *Solide*, Captain *Marchand*, &c. he would advise navigators to prefer *Gaspar*'s Strait to all the Passages of *Clements'* Strait, whether they are coming from the northward, or the southward. I refer the Reader to what I have said of both in the *Analysis of my general Chart of the Straits between Banca and Billiton*.

" of

" of danger, five fathoms alongside of it, and eight, nine and ten fathoms " sand all round." I have given, (farther back, pages 439 and 440,) the description and the bearings of this Shoal such as they are engraved on the Plan of CLEMENTS' STRAIT, published in 1786 by ALEXANDER DALRYMPLE: the bearings given by ROBERTSON differ not from those there mentioned.

" It lies nearly north from the Reef that extends a mile and a half to the " East of SADDLE ISLAND (which is FLAT ISLAND on my chart): to the " westward of that Reef there seemed deep water between the island and it. I " know of no other danger in this track from TREACHEROUS BAY, it having " been well explored by the boats of the fleet."

ROBERTSON (page 6 of his Memoir) mentions some remarks made by English Captains on others of the EAST PASSAGES, besides that through which CLEMENTS came out with his fleet.

The passage which opens between the group of the four western islands and MIDDLE Island, that is, between this last mentioned island and SANDY-BEACH, through which the ATLAS, the ROYAL ADMIRAL, &c. passed, is divided into two passages, namely, one between SANDY-BEACH and the SHOAL * situated to the northward of this small island between this SHOAL and MIDDLE Island. " Captain COOPER," says ROBERTSON, " in going out to CHINA, " in 1785, followed a Portuguese to the West of it: and Captain EASTER- " BROOK, in coming home, came the same way; Captain HUDDART, home- " ward, in 1785, passed to the East. It is a very narrow passage, and con- " sequently a more dangerous one, although good soundings and deep water,

* This *Shoal* is that of which I have spoken (farther back, pages 438 and 439) on which Captain *Cooper* saw the water have a green colour, and the Portuguese Captain, in company with whom he was then sailing, told him that the sea was often seen to break in this quarter.

" owing

" owing to the ſaid SHOAL, on which the ſea does not at all times break, and " which was the caſe when theſe ſhips paſſed it; but it broke very high when " the fleet paſſed (CLEMENTS' Fleet anchored to the north-eaſt and eaſt- " north-eaſt of this ſhoal); and from where I took the bearings, ſeemed to " block up the whole paſſage. I think, although theſe ſhips have gone that " way, it is by no means to be preferred. The two ſmall iſlands to the " NORTH-EAST and SOUTH-EAST of MIDDLE Iſland were not ſeen to break, " but they certainly *increaſe* the number of dangers in that track. Captain " EASTERBROOKE obſerves, the ſouth-eaſternmoſt or ſmall ſhoal is in one " with GASPAR Iſland *, bearing north half weſt; and he adviſes keeping " the large or MIDDLE SHOAL on board in preference of being too near the " ſmall ones, which cannot at all times be ſo well *diſcovered* as the large one, " which when it don't break ſhews a ſtrong rippling and has but a few feet " water on it.

" Captain HUDDART obſerves, in his remark of that paſſage, there are " two dangerous ſhoals to the eaſtward of MIDDLE Iſland, and ſcarce two " miles aſunder, which renders it more difficult: I paſſed *between* them " in 1788, but to the eaſtward of both in 1785, which paſſage I ſhould al- " ways prefer as the ſafeſt, on account of the ſtrong currents that ſet athwart " to the ſouth-eaſtward during the North-eaſt monſoon, ſometimes above " three knots *per* hour."

* This *ſouth-eaſternmoſt Shoal* would be, on my Chart, ſouth ½ weſt of *Gaſpar*, rather than ſouth ½ eaſt. It is probable that Captain *Eaſterbrooke* deduced this bearing, and obſerved it not: the diſtance of 10 leagues at which this *Shoal* is from *Gaſpar* admits not of this iſland being ſeen when you are near enough to diſtinguiſh the place occupied by the ſhoal, which does not always break, and which did not break when Captain *Eaſterbrooke* paſſed. The relative bearings of *Middle* Iſland, *Gaſpar* Iſland, the *Eaſt* Point and the *South-eaſt* Point of *Banca*, &c. ſuch as they are given by the croſs bearings of *Wilſon*, *Marchand*, *Cooper*, &c. place the South-eaſt part of *Middle* Iſland ſouth ½ weſt from *Gaſpar*, and not ſouth ½ eaſt.

Remarks on the courſe to be held on coming out of the STRAITS, *when bound to the ſouthward, after paſſing the parallel of the* SOUTH-EAST POINT *of* BANCA.

The Reader has ſeen (farther back, pages 436 to 438) the remarks of LARKINS, WILSON, and MARCHAND, reſpecting the depth of water and the quality of the ground to the ſouthward of the Straits, to theſe we may add thoſe mentioned by ROBERTSON in his *Short Account*, Pages 5 and 6.

" From SADDLE ISLAND, ſteer down," ſays he, " for the two ſmall " iſlands call d BREAKER Iſlands, in my Chart (by ſome called SHOAL-WATER " Iſland) keep to the weſtward of them: *they* are diſtant from SADDLE " Iſland about ſix or ſeven leagues, and bear nearly ſouth from it (ſouth by " eaſt on his chart).

" In following this route, you leave to the weſtward the VANSITTART's " Shoal, the only known danger in this quarter."

After having paſſed beyond the parallel of the ſouthern extreme of the Shoal, " we met with nothing particular," continues ROBERTSON, " in our " run to the ſouthward, except the two ſhoals, which are to the ſouthward " of BREAKER Iſlands, on the ſouthernmoſt of which is a ſmall dry white " ſand, diſtant nearly ten miles from the iſlands; I make no doubt but they " are the ſouthernmoſt ſhoals that ſurround BILLITON on that ſide."

I refer the Reader to what I have ſaid farther back (pages 408 and 409) of another SHOAL ſeen by DORDELIN, in 1784, which appears to be ſituated 14 miles to the weſtward of the middle of the ſouthernmoſt of the two preceding Shoals.

" We

"We found all along good regular ſoundings," ſays ROBERTSON: "eight "fathoms was the leaſt water when to the ſouth-weſt of the ſouthernmoſt "*Shoal*, which bank runs acroſs to the north-weſt with eight and ſeven fa- "thoms upon it, ſand and ouze, until it joins FOUL POINT Bank * to the "ſouthward of BANCA; which may be obſerved upon the Chart by the "ſoundings of the different ſhips' tracks; it then gradually deepens to "13 fathoms, to within ſight of the NORTH WATCHER, whoſe latitude I "make 5° 12′ 30″ ſouth, bearing from BREAKER ISLANDS ſouth 24° weſt 124 "miles."

The following remarks particularly concern ſhips that are come out of the CHINA SEA by GASPAR STRAIT.

"Having got to the ſouthward of MIDDLE Iſland," ſays ROBERTSON, "(page 10 of his *Short Account*), paſs the SOUTH-EAST Point of BANCA at "a moderate diſtance, and keep a ſoutherly courſe, ſo as not to get to the "weſtward of the SOUTH-EAST Point of BANCA, until you loſe ſight of the "low land of the coaſt which joins the hummocks, that is to ſay, when the "ſouth coaſt of BANCA appears like ſeparate iſlands, you are then far enough "to the ſouthward, and may haul as much weſterly as neceſſary. In the next "place, great care muſt be taken to avoid the VANSITTART's Shoal, which "lies to the eaſtward of this track, and to the ſouthward (or rather to the "ſouth by eaſt) of MIDDLE Iſland. To keep clear of this ſhoal, ſteer a "courſe ſo as to keep MIDDLE Iſland always a little to the *eaſtward* of *north*, "which will carry you wide of it to the weſtward.

"Having paſſed theſe dangers, a ſouth-ſouth-weſt courſe made good, will

* This is the name which *Robertſon* gives to the whole of thoſe ſhoals, breakers, &c. which are ſituated to the *South-eaſt* of the *South* Point of *Banca*.

" carry you up to the BROTHERS, the northernmoſt of which lies in latitude " 5° 9′ ſouth, and bears from MIDDLE Iſland ſouth 23° weſt, about 50 " leagues. I know of no other danger in theſe tracks," adds he, ſo that the " ſame caution is neceſſary to be obſerved in going to the northward as here " deſcribed in ſailing from the northward."

Remarks on GASPAR'S STRAIT.

Although ROBERTSON never paſſed through GASPAR STRAIT or the WEST PASSAGE, yet he gives ſome hints (taken, no doubt, from the journals of his countrymen) reſpecting the precautions which are to be taken by ſhips coming from the northward and bound through this Strait.

" If coming from the northward or AURO Iſlands with an intent of " paſſing through the GASPAR Strait," ſays he, (page 8 of his Memoir) " get ſight of PULO TOTY, whoſe latitude is 0° 58′ ſouth; paſs it to the eaſt, " and ſteer down for GASPAR Iſland; taking care not to come nearer to the " BANCA ſhore than 16 fathoms. GASPAR bears from PULO TOTY ſouth-" eaſt diſtance about 40 leagues, the fair way ſoundings between them is 17 " and 18 fathoms, which is a very good guide to go by at night or in thick " hazy weather; however, I would adviſe by no means to come nearer " GASPAR in the dark than 7 leagues, which will keep you perfectly clear of " the ſhoals to the northward of it, on which the BELVIDERE and WARREN " HASTINGS ſtruck *.

* It ſeems to me that this is a very incorrect expreſſion, which may lead navigators into an error, to ſay in general terms that the *Shoals* are to the northward of *Gaſpar*; for the middle of the *Warren Haſtings*'s Shoal lies weſt-ſouth-weſt from that iſland, and thus it is that *Robertſon* himſelf has laid it down in the new edition of his Chart and of his Plan: and the *Belvidere*'s ſhoal, as he himſelf is going to tell us, is ſituated to the north-north-weſt of *Gaſpar*.

" The

" The BELVIDERE's Shoal was firſt ſeen by the SULIVAN, HAWKE, and " PONSBORNE, 1784, 1785; GASPAR Iſland bears from ſouth-ſouth-eaſt 4 or " 5 leagues, and the NORTH-EAST Point (the EAST POINT on my Chart) of " BANCA, ſouth by weſt ½ weſt diſtance about 7 leagues."

I know not from what journal ROBERTSON has taken the preceding bearings, but I have mentioned (farther back, page 365) thoſe which were taken by the SULIVAN, ſuch as I have found them in her original Journal, publiſhed by Mr. DALRYMPLE.

Thoſe of the HAWKE, likewiſe taken from the Journal of that ſhip are as follows *:

1785, Jan. 16, at 5 P. M.

" Saw the north-eaſt part of BANCA (its Eaſt Point)	S. W.	4 leagues.
GASPAR Iſland	S. S. E. ½ E.	3 leagues.
BREAKERS on Larboard quarter	N. E.	2 leagues.
BREAKERS on the beam.....	E. by N.	1 league."

In the poſition in which the HAWKE was, having GASPAR ſouth-ſouth-eaſt half eaſt diſtant 3 leagues, the *Breakers* which Captain RIVINGTON ſaw on the larboard quarter, 2 leagues to the north-eaſt, appear to me, beyond a doubt, to be the ſame as thoſe which DORDELIN had ſeen, and along which he had ranged throughout their whole length; (farther back, page 364).

* Extract from the Journal of the *Hawke*, Captain *Robert Rivington*.—*See* Collection of *Memoirs* publiſhed by *Alexander Dalrymple: Appendix to Memoir of Chart of Sunda and Banca*, page 28.

As to the *Breakers* which the HAWKE had at the ſame time on her beam, eaſt by north 1 league, I do not believe that they have been ſeen by any other ſhip; and I have determined to ſuppreſs thoſe which are indicated in the Journal of the SULIVAN, and which I had announced (farther back, pages 367 and 368) as proper to be preſerved on my Chart: for the *Breakers* of the SULIVAN, if they are not thoſe of DORDELIN, might be the *Breakers* ſeen on the HAWKE's beam, with which they are confounded: the diſtance at which the SULIVAN was in regard to GASPAR is the ſame as that of the HAWKE, and the bearing differs only by about a point.

The bearings of the PONSBORNE which ſailed in 1785, in company with the HAWKE, make no mention of *Breakers* *: were they not ſeen from the PONSBORNE while they were ſet by the HAWKE? This is very poſſible, if the *Breakers* did not break, or broke but little, and if the PONSBORNE was farther from them than the HAWKE.

I reſume ROBERTSON's remarks reſpecting the ſhoals againſt which it is neceſſary for the navigator to be on his guard, if he intends to paſs through GASPAR Strait, in coming from the northward.

" The WARREN HASTINGS's Shoal," ſays he, " was firſt ſeen by the " HAWKE, in 1785†. The bearings of the land from where the HASTINGS " ſtruck, is; viz."

* Same Collection, ſame *Appendix*, page 25.

† I know not whether *Robertſon*, in ſaying that the *Warren Haſtings*'s Shoal had been ſeen, in 1785, by the *Hawke*, means that this is one of the *Breakers* which this ſhip had ſet on the 5th of June at 5 P. M.; but it has juſt been ſeen, above, that one of theſe ſhoals of the *Hawke* appears to be the ſame as the *Breakers* of *Dordelin*; and that the other is to be found in a poſition where it does not ſeem that any other veſſel has ever ſeen a ſhoal.

Theſe

Theſe are the ſame that I have reported farther back (Page 359, Column from LARKINS's Journal; but, if ROBERTSON, in order to laying down this Shoal in the new edition of his Chart and of his Plan of the STRAITS, has made uſe of the diſtances given in this Journal, and which he has copied into his Memoir: namely, 6 *miles* from GASPAR; 9 miles from TREE Iſland; I am at a loſs to conceive how he can have aſſigned to it a poſition which differs very little from that I give it according to the reſult of my trigonometrical operations, which carries the diſtance from GASPAR to 8.85 miles, and that from TREE Iſland to 6.7 miles (farther back, page 371).

ROBERTSON continues: " The BELVIDERE's Shoal and this were both ſeen " to break, when the HAWKE and PONSBORNE paſſed, but ſuppoſe they were " not in that ſtate when the above ſhips grounded: theſe ſhoals *are in general* " *coral rock and ſteep to.*"

I ſhall take the liberty of making two obſervations on this paſſage of ROBERTSON:

1. It has appeared to me that the BELVIDERE's Shoal and that of the WARREN HASTINGS are but one and the ſame ſhoal (farther back, pages 372 and 373).

2. I did not know that the BELVIDERE had grounded on the ſhoal that is mentioned in the Extract from her Journal which I took from the *Memoirs* publiſhed by ALEXANDER DALRYMPLE (farther back, page 371): it is there mentioned that " the BELVIDERE being *at anchor* in 10 fathoms, GASPAR " eaſt-ſouth-eaſt $3\frac{1}{2}$ leagues, TREE Iſland ſouth by eaſt, had the *Shoal* about " a cable's length diſtant, north-north-eaſt and ſouth-ſouth-weſt from the " ſhip, &c." But it is not ſaid that the BELVIDERE *grounded* on this ſhoal;

it

it is even ſaid that ſhe was *at anchor in* 10 *fathoms water* when ſhe diſcovered it. This is the caſe with another *Shoal* which ſhe diſcovered, when at anchor in 16 fathoms, at the diſtance of 12 miles to the weſt-north-weſt of GASPAR; and which I preſume to be the northern part of the WARREN HASTINGS's Shoal (farther back, page 372); but it is not ſaid that ſhe grounded on either of the ſhoals of which ſhe took the ſoundings.

ROBERTSON, ſtill in the ſuppoſition that the BELVIDERE and the WARREN HASTINGS ſaw two different Shoals, which I believe to be the ſame, interrupted, perhaps, by channels where a great depth of water is found (farther back, pages 372 and 373) adds:

" Having got ſight of GASPAR Iſland, ſteer down for it, keeping it to the
" eaſtward of ſouth-ſouth-eaſt to avoid the BELVIDERE's Shoal, go between
" it and TREE Iſland, taking care to avoid alſo the WARREN HASTINGS's
" Shoal, or paſs TREE Iſland to the Weſt, as occaſion offers; there is 20
" fathoms to the Weſt of it, and I ſhould think it is the beſt track, as both
" the WARREN HASTINGS, and BELVIDERE's Shoals are, in that caſe, left on
" the eaſt."

On account of the reputation of Mr. ROBERTSON and the numerous reſearches that he has made for conſtructing his Chart and his Plan of the STRAITS, I have thought it my duty to report his opinions reſpecting the tracks to be followed in ſtanding for GASPAR's Strait, when coming from the northward although, not having himſelf frequented this track, he cannot inſtruct us here from his own experience. For more ample directions, I refer the Reader to the general remarks on making the land in coming to the Straits from the northward and on the navigation in GASPAR's Strait or the WEST PASSAGE.

For the reſt, I am of opinion that when navigators ſhall have compared what is ſaid, on the one hand, of GASPAR's Strait, with what is ſaid on the other of CLEMENTS' Strait, they will not heſitate to prefer the former whenever the wind and tide ſhall leave them the option. (*See* farther back, pages 108 to 110).

PARIS, the 15th of Prairial, Year VII. (3rd of June, 1799.)

Note

N O T E

FOR THE STRAITS TO THE EAST OF BANCA *.

" IN making known to me, Sir, the new chart which Captain WILSON has " constructed of the Strait to the EAST of BANCA, and the new Memoir " which Mr. DALRYMPLE has published, you ask me whether I have any " thing to add to the Analysis of the Chart of the same Strait, that I have " placed at the end of the Narrative of MARCHAND's Voyage, which you " honour me by translating. You have been enabled to judge from the result " of my labour, that I had no knowledge either of the Chart or of the " Memoir which you have been so good as to address to me: I should cer- " tainly have made use of them, and the former Chart which Captain " WILSON had published, had given me too high an opinion of his know- " ledge and talents, not to have been anxious to employ his new observa- " tions which afford a degree of correctness still superior to that which had " made me distinguish his preceding ones.

" On examining my Chart, as if it were the work of another, and " on comparing it with the new chart of Captain WILSON, the follow- " ing are the principal remarks which have presented themselves to my " mind:

" 1. Latitude of GASPAR Island, which Captain WILSON designates on " his new chart, by the name of PULO GLASSA.

* For the satisfaction of the nautical reader, we here give a translation of a letter which we have lately received from M. *Fleurieu*, in answer to one accompanying Captain *Wilson*'s last Chart of the Strait to the east of *Banca*.—*Translator*.

" It has been ſeen (page 356 of this Volume) that I had thought " that, although we had a rather conſiderable number of obſervations for " the latitude of that iſland, it did not appear that we were able to " determine it with exactneſs. I have pointed out the reaſons which had " decided me to fix on 2° 21′: This is the latitude which had been con- " cluded from the obſervations of the SOLIDE, made on the very pa- " rallel of the iſland, and at one of the periods of the year the moſt fa- " vourable; at the very period of the ſolſtice, Captain WILSON had ob- " ſerved it 2° 21′, and made it 2° 20′ on his former chart (mean 2° 21′). " DORDELIN, in 1784, in going to CHINA, had obſerved 2° 21′ 15″: Cap- " tain COOPER's chart gives 2° 21′: At this day, Captain WILSON, ac- " cording to his new obſervations, carries it to 2° 25′ 35″ (difference with " reſpect to the latitude obſerved on board the SOLIDE, 4′ 35″). Will not " ſubſequent obſervations again change this determination?—I need not ſay " that, whatever may be the latitude admitted for GASPAR Iſland, it muſt " affect that of all the points which have been or ſhall be ſubjected to " it.—It appears that the latter obſervations of Captain WILSON were " made in the month of Auguſt, which is not the period of the year " the moſt favourable, if he did not make uſe of the meridian altitudes of " the ſun.

" 2. Longitude of GASPAR Iſland.

" As for the longitude of that iſland, I had from calculations (page 358 of " this Vol.) made it 104° 45′ eaſt from PARIS, or 107° 5′ 15″ eaſt from GREEN- " WICH. It is ſeen in the Memoir of Mr. DALRYMPLE, relative to the latter " operations of Captain WILSON (Page XII. of the Memoir) that this na- " vigator has likewiſe made it from his obſervations and his chronometers, " 107° 5′ 15″.

" 3. The

" 3. The position of the Shoal situated to the north-west by west of GASPAR Island, which had been seen or reconnoitred for the first time, in " 1784, by DORDELIN, and which Captain WILSON at this day names the " BELVIDERE'S SHOALS, seems to require a verification. The French navi- " gator who saw at the same time the *Rock which does not appear above water* " (on the northern part of the shoal), and GASPAR Island, places this rock " to the north 10° west and at the distance of 17 miles from GASPAR Island: " According to Captain WILSON's new Chart, the bearing should be north " 16° west, and the distance 14½ miles.

" 4. The *Breaker* which I have marked *seen by* RIVINGTON (commander of " the HAWKE) *position doubtful*, might be the south part of DORDELIN's " Shoal (the BELVIDERE's Shoal). It is well known that these sorts of " overfalls or quays, formed by coral rocks, and steep to, leave clear pas- " sages between their most elevated parts: it is possible that DORDELIN and " RIVINGTON may have passed between two portions of the large *Shoal*, " separated by a channel. But, as it would be highly imprudent for a navi- " gator to entangle himself voluntarily in these passages, even were they well " known, on the chart is comprised in the same enclosure *not navigable*, the " space of sea occupied by the whole of the group composed of scattered " *Breakers*.

" 5. The *Breakers* which I have marked *seen by* CROZET, *position doubtful*, " can be no other, methinks, than those on which the VANSITTART was lost. " The position which Captain WILSON assigns to them on his new Chart, " must be preferred, without hesitation, to the doubtful position, which had " been indicated to me only from the line of CROZET's track, which is simply " marked on one of D'APRÈS' charts.

" 6. The *four Breakers* between which the SOLIDE paſſed, and which had " been ſeen antecedently by CROZET, commander of the MASCARIN, are not " compriſed in the ſpace of ſea which the new chart of Captain WILSON has " repreſented: if this able navigator had had an opportunity of examining " them, he would have been enabled to verify their ſituation, relatively to " the EAST point of BANCA and GASPAR Iſland.

" 7. The new chart confirms the poſition which I had given to the WAR- " REN HASTINGS'S SHOAL, different from that which Captain COOPER, who " had remained aground for ſeveral hours on this ſhoal, had aſſigned to it on " his chart.

" 8. It has been ſeen (pages 382 and 383 of this Vol.) what motives had de- " termined me not to adopt the poſition of the SOUTH-WEST point of MID- " DLE or PASSAGE Iſland, with reſpect to the NORTH-EAST point of the " PENINSULA OF SEL, ſuch as Captain WILSON had fixed it from his former " operations, namely, SOUTH-WEST Point north 74° eaſt of the NORTH-EAST " point, at the diſtance of ſix miles and a half. The bearings taken on board " the SOLIDE, and the ſeries of my trigonometrical operations had led me to " give for the bearing north 56° eaſt, and the diſtance is likewiſe $6\frac{1}{2}$ miles. " On the new chart, the bearing is north 65° eaſt (that is 9° leſs than on the " old one) and the diſtance there is carried to $8\frac{2}{3}$ miles. I am diſpoſed to " believe that Captain WILSON is in the right; but I obſerve that no " inconvenience can ariſe from a chart repreſenting a paſſage *narrower* than " it really is: the contrary defect would preſent a danger.

" 9. Captain WILSON marks *three* iſlands of *the gulf:* they were only two " in number on his old chart and on others, and the SOLIDE ſaw but *two:*

" but

" but this difference deſerves little attention; navigation does not extend into
" the gulf where they are ſituated.

" 10. It does not appear to me doubtful, from the latter operations of
" Captain WILSON that SADDLE Iſland (ILE AUX MAMMELLES) is *more to the*
" *northward* and more to the eaſtward than FLAT or Low Iſland; a relative
" poſition which G. ROBERTSON had given to thoſe iſlands on his Plan. I
" had been juſtified in believing that the names had been interchanged on
" this plan, becauſe DORDELIN and COOPER (page 389 of this volume) who
" had both entered into the Strait by the ſouthward, had, both, placed L'ILE
" AUX MAMMELLES (SADDLE Iſland) more to the *ſouthward* and more to the
" weſtward than FLAT or Low Iſland.

" 11. On WILSON's new chart are ſeen lines of a few iſlands *in one* with
" each other: he has ſet in the ſame direction (eaſt 21° 30′ north) the ſouth
" point of SOUTH Iſland, the north-eaſt point of SADDLE Iſland, and the
" north-weſt point of FLAT Iſland, the ſouth point of SADDLE Iſland, and
" the middle of TABLE Iſland. Theſe bearings are worthy to be preſerved,
" as well as thoſe by which he fixed the relative poſitions of the ſmall iſlands
" ſituated to the ſouth-eaſt of MIDDLE or PASSAGE Iſland, both with reſpect
" to each other and in regard to the large iſland.

" 12. SANDY BEACH or SANDY Iſland, is placed on the new chart with
" reſpect to the moſt ſouthern iſland of the group, in the bearing and at the
" diſtance which I had aſſigned to them.

" Captain WILSON places SANDY BEACH in 2° 59′ 40″: this iſland is on
" my chart in 2° 55′ 20″—difference 4′ 20″—but as we have a difference of
" 4′ 35″ in the ſame direction, reſpecting the latitude of GASPAR Iſland, it
" thence

" thence reſults that the difference between the two iſlands is evidently the
" ſame on the two charts.

" 13. It has been ſeen (page 483 of this volume) that I had no know-
" ledge of the large ſhoal, called the VANSITTART'S SHOAL, and ſituated to
" the ſouth of MIDDLE Iſland, but from the ſecond edition of the Plan and
" Memoir of G. ROBERTSON who places the northern part of it 4 or 5 mi-
" nutes more to the ſouthward than the moſt ſouthern iſlands: but, on the
" new chart of Captain WILSON who was not acquainted with this ſhoal at
" the period of his former operations in the Strait, the northern part of the
" VANSITTART'S Shoal is not 2 minutes more ſoutherly than the moſt ſouthern
" part of the Group: it occupies, beſides $6\frac{1}{3}$ miles in latitude, by $4\frac{3}{4}$ in lon-
" gitude: its poſition muſt be fixed according to the new bearings.

" 14. Captain WILSON'S laſt chart preſents ſets of ſoundings extremely
" intereſting to the ſouthward of the ſouth coaſt of BANCA, a portion of ſea
" reſpecting which we had as yet no ſatisfactory detail. His labour in this
" part proves, as I had thought, that after having got clear of the land, at
" the ſouthern outlet of the Strait, you muſt not endeavour to make ſouthing
" and weſting, before you have reached the latitude of three degrees and a
" half.

" 15. I had taken the liberty (page 485 note * of this volume) to combat
" the opinion of G. ROBERTSON, who ſays that CLEMENTS' Strait is prefer-
" able to all others between BANCA and BILLITON, and I had claimed the
" preference for GASPAR'S PASSAGE which the Engliſh at preſent call MAC-
" CLESFIELD'S Paſſage; it appears that the Engliſh Eaſt-India Company, no
" doubt, from the advice of their captains, themſelves prefer it for their
" ſhips; for, in the Inſtructions which they had given to Captain WILSON,
" and

" and which were drawn up by Mr. DALRYMPLE, the principal object of " all the operations pointed out was the exact survey of GASPAR'S " PASSAGE."

PARIS, 23rd of Germinal. Year IX.
(13th of April 1801.)

JOURNAL

JOURNAL

OF

THE ROUTE.

JOURNAL

OF THE

ROUTE OF THE SHIP SOLIDE,

DURING HER

VOYAGE ROUND THE WORLD,

IN 1790, 1791, AND 1792.

BY CAPTAIN PROSPER CHANAL.

THE titles of the Columns ſufficiently indicate what each contains; but it is neceſſary to make known by what means Captain CHANAL obtained ſome of the reſults which are there inſerted.

The columns of Latitude and Longitude, by *account* and by *obſervation*, ſhew the poſition of the ſhip, according to the dead reckoning, and according to the obſervations, *for the inſtant of noon* of each day, unleſs it be expreſsly ſpecified that it is her poſition at another period of the day.

The latitude *by account* is that which was indicated each day by the dead reckoning, by deducing from the reſult of the laſt day of obſervation the progreſs in latitude by account in the interval of the two periods.

The longitude *by account* is the reſult of the dead reckoning from the laſt *Point of Departure*, deduced from the longitude of that point.

The

The longitude *by obſervation* is the mean reſult of the obſervations of the moon's diſtance from the ſun or ſtars, reduced to the inſtant of noon of the day on which they were made; or the longitude deduced from the bearing of an iſland, a cape, &c. whoſe poſition is fixed by aſtronomical obſervations.

The ſituation of the ſun, moon, or ſtars, in regard to each other, as ſeen in the column of *Remarks* and *Obſervations*, exhibits their ſituation in the heavens at the inſtant when their diſtance was obſerved: thus, Diſt. ☉—☾, indicates that the moon was to the eaſt of the ſun; and ☽—☉, that it was to the weſt: it is the ſame with reſpect to the moon's diſtance from the ſtars.

The longitude is given in this laſt-mentioned column as it was found at the time of the obſervation: it was reduced to that of noon by the dead reckoning, in order that it might be inſcribed, at that period, in the fifth column of the month. The letter *M* deſignates the reſult of Captain MARCHAND: *Ch*, that of Captain CHANAL. The letters *A. M.* (abbreviation of *ante meridiem)* indicates that the time is before noon, *P. M.* (abbreviation of *poſt meridiem*) that the time is after noon.

Each determination of the variation of the magnetic needle carries with it the indication of the method which was employed for aſcertaining it by obſervation.

In all the points of the compaſs, in the column of *Remarks*, &c. allowance is made for the variation of the needle, and they are reduced to the *true North*.

In the interval from the 14th to the 29th of December 1790, and in that from the 5th to the 14th of Auguſt 1792, during which the ſhip ſailed in the MEDITERRANEAN, no mention is made of the longitude, becauſe Captain MARCHAND directed his courſe by a *plane* Chart; this deficiency has been ſupplied, by indicating each day the *diſtance run* from the one noon to the other, as well as the direction of the *courſe*, and by inſerting in the Journal the *bearings* which were taken in ſight of land: theſe *data*, combined with the latitude obſerved, will give the poſition of the ſhip for each day at noon.

TIME.	COURSE.	DISTANCE.	LATITUDE by obſerv. NORTH.	VARIATION of the Compaſs. WEST.
1790.		*LEAGUES.*	° ′	° ′
Dec. 14	Point of departure within ſight of Cape *Sicié*, bearing E. N. E. ½ E. 11 leagues.			
15	S. by W. 2° W.	35,87	41 17	
16	*Monte Toro* of the Iſland of *Minorca* bearing W. S. W. 7 leagues. . . .		39 36	
17	S. by E. 3° E.	16,33	39 08	
18	S. by E.	1,50		
19	S. W. 3° S.	9,50	38 56	
20	S.	4,33		
21	W. S. W.	27,50		
22	W. by S. 3° S.	31,33	37 33	
23	Cape *Palos* N. 6 leagues.		37 06	
24	Cape *de Gata* W. S. W. ½ S. 6 leagues.		36 56	
25	Cape *Torre Molinos* W. by N. 9 leagues.		36 28	22 08 Amp. Weſtly.
26	The Mountain of *Velez-Malaga* N. W.		36 20	
27	The ſame N. W. 6° W.		36 09	
28	*Caſtel-de-Ferro* N. by E.		36 32	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
14	. . .	N. W. ſtrong breeze; and clear weather.	On the 14th in the morning, the SOLIDE ſet ſail from the harbour of *Marſeilles*.
15	. . .	From N. W. to N. moderate; fine weather.	
16	. . .	From N. W. to W. faint breeze; cloudy.	On the 16th, at 7 A. M. ſaw the Iſland of *Minorca*, bearing S. W. by W. diſtant 7 leagues.
17	. . .	From W. N. W. to W. S. W. faint; clear weather.	
18	. . .	From W. S. W. to N. W. accompanied by ſqualls; weather overcaſt.	From the 18th to the 20th, ſtrong gales and a very heavy ſea. Lay to.
19	. . .	From N. W. to E. N. E. variable and ſqually; weather overcaſt.	
20	. . .	From W. to N. W. violent ſqualls; cloudy weather.	
21	. . .	From N. to N. E. faint; rain at intervals.	
22	. . .	N. N. E. faint; the weather cloudy.	On the 22d, at 7 A. M. ſaw the Coaſt of *Spain* to the N. W. ½ W.
23	. . .	From N. to N. W. var. light; clear weather.	
24	. . .	From E. to N. W. round by the S. faint; fine weather.	
25	. . .	From E. to N. freſh; fine weather.	
26	. . .	From S. W. to N. W. calm at intervals; fine weather.	On the 26th, the currents had carried the ſhip to the eaſtward about 6 leagues.
27	. . .	Calm, puffs from the S. to the W; fine weather.	On the 27th and 28th, they ſet to the S. E. at the ſame rate.
28	. . .	W. N. W. light breeze and fine weather.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1791.	° ′	° ′	° ′	° ′	° ′
Dec. 29	The Mountain of d'*Eſtepona* [*Sierra Bermeja*] W.N.W. that of *Marbella* N. N. E.				
29	Point of Departure within ſight of Cape *Spartel* . . .	35 52	. . .	8 14	
30	35 13	35 23	10 16		
31	34 45	. . .	11 49		
1791. *Jan.* 1	33 47	33 50	13 55		
2	32 28	. . .	16 08	. . .	19 00 Amp. Eaſtly.
3	31 14	31 08	17 51	. . .	19 10 by 2 Azim. 19 50 Amp. Weſtly.
4	30 45	30 31	18 40		
5	30 09	30 08	19 46	In ſight of the Peak of *Teneriffe*. 19 06	17 50 Azim.
6	28 40	28 36	21 33		
7	26 54	26 50	22 18	. . .	14 30 Amp. Weſtly.
8	24 26	24 19	23 03	. . .	14 16 Amp. Weſtly.
9	21 21	21 24	23 20	21 46	13 10 Amp. Weſtly.
10	18 52	18 45	23 06		
11	17 15	71 20	22 49		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
29	. . .	From S. E. to E. freſh, ſqualls and rain; lightning, thick, dark weather.	On the 29th at noon, ſaw the Rock of *Gibraltar* to the W. S. W. ½ W: in the afternoon paſſed the Strait of that name; at 8 P.M. we were clear of it.
29	. . .	From E. to E. N. E. freſh in ſqualls; weather overcaſt.	On the 29th, at 8 P. M. ſet Cape *Spartel* S. 1 ⅔ leagues; ſhortly after, loſt of the land.
30	. . .	N. E. Freſh; cloudy.	
31	. . .	From N. W. to S. S. W. variable; ſlight ſqualls.	
Jan.			
1	. . .	From S. E. to N. E. freſh breeze; cloudy weather.	
2	. . .	From N. N. E. to E.N.E. pleaſant breeze and miſty.	
3	. . .	N. variable, cloudy weather and miſt.	
4	. . .	From N. W. to N. E. faint, and fine weather.	On the 4th, at 10 A. M. ſaw *Salvage* Iſland bearing N. by W. 3° W. diſtant 4 or 5 leagues.
5	. . .	N. variable, faint, and miſt.	On the 5th, at 1h 45′ P. M. ſaw the Peak of *Teneriffe* bearing S. 6½°, E. 35 leagues. This day ſaw *Flying-fiſhes* for the firſt time.
6	. . .	N. E. pleaſant breeze, and cloudy weather.	
7	. . .	From N. E. to S. E. freſh breeze and fine weather.	On the 6th, at 5 ½h, A. M. ſaw the Iſland of *Palma* bearing S. S. E. ½ S. 8 or 10 leagues; at 3 P. M. Iſland of *Ferro* S. S. E.
8	. . .	E.S.E. freſh; clear weather.	
9	. . .	E. freſh breeze; ditto weather.	On the 9th, at 3h 45′ P.M. Long. by 2 ſets ☉ — ☾ . . . . } ° ′ ″ *Ch.* 21 45 00 Weſt.
10	. . .	E. moderate breeze, and fog.	
11	. . .	From E. S. E. to E.N.E. var. faint; thick fog.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1791.	° ′	° ′	° ′	° ′	° ′
Jan. 12	15 42	15 42	23 09		
13	15 08	. . .	25 08		
14	15 18	15 02	26 29		
	Point of Bearing of the Iſland of *Mayo*.				
	. . .	15 02	. . .	25 28½	
15, 16, 17	At anchor in *la Praya* Bay, Iſland of *St. Yago*.				14 12 Amp. Weſtly 14 12 by Azim.
18	Point of Departure from the Iſland of *Sant Yago*.				
	. . .	14 53	. . .	25 51	
19	12 02	12 02	24 40	. . .	18 10 Amp. W. dout.
20	9 57	9 57	23 47	. . .	12 31 by 4 Azim. 12 48 Amp. Weſtly.
21	8 39	8 39	23 12	. . .	11 50 Azim.
22	7 34	7 30	22 30	. . .	12 20 Azim.
23	6 25	6 28	21 51	. . .	11 27 Amp. Eaſtly. 11 54 by 4 Azim.
24	6 09	6 13	21 37		
25	5 46	. . .	21 23		
26	5 22	. . .	21 18		
27	4 40	. . .	21 04		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Jan.	Above the freezing point.		
12	. . .	From N. E. to N. var. fr. cloudy and foggy weather.	On the 11th, 12th, 13th, the sea covered with *Mollusca*. In the night, the water luminous. Saw some *Flying-fishes*, a *Shark*, and a shoal of *Porpoises*.
13	. . .	From N. to N. E. fresh; cloudy and foggy.	
14	. . .	From N. to N. E. var. faint, squalls and rain.	On the 14th, at 9h ½ A. M. saw the Island of *Mayo* N. N. W.—At noon the south point of the island N. distant 1 league.—At 3 P. M. the Island of *St. Jago* S.W. by W.
15	17,5	N. N. E. fresh breeze and fine weather.	
16	17,5	N.E. moderate; fine weather.	On the 15th A. M. anchored in *La Praya* Bay, in the Island of *St. Jago*.
17	17,5	N. N. E. fresh; fine weather.	
18	17,5	N. E. fresh; fine weather, slight fog.	On the 18th, in the morning, got under way from *La Praya* Bay.
19	18,0	E. N. E. fresh breeze; fine weather.	On the 19th, saw a *Tropic-bird*.
20	19,5	E. N. E. ditto, ditto.	
21	21,5	From E. N. E. to E. moderate; fine weather.	On the 21st, saw some *Porpoises*, *Doradoes*, *Tunnies*, and *Flying-fishes*.
22	21,5	From N. N. E. to E.N.E. moderate; cloudy weather.	On the 22d, saw a *Booby*.
23	21,0	From N. E. to E. faint, almost calm; fine weather.	
24	22,0	N. E. variable, almost calm; dull weather, fog.	
25	21,0	Variable, calm; with heavy rain.	On the 25th, saw the same fishes in great numbers; the sea luminous during the night.
26	20,0	Var. calm, and squalls at intervals; storm and rain.	On the 26th, saw some *Sea-swallows* and the same fishes; the sea luminous at night.
27	20,0	From N. E. to E. in squalls; stormy weather, rain.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1791.	° ′	° ′	° ′	° ′	° ′
Jan. 28	3 35	3 36	20 35	. . .	14 09 Azim. 13 52 by 4 Azim.
29	2 57	. . .	20 37		
30	2 29	. . .	21 08		
31	1 36	2 26	21 29	. . .	12 18 by 6 Azim. 12 36 Amp. Eaſtly.
Feb. 1	1 11	1 23	22 17	. . .	10 17 by 3 Azim. 10 57 Amp. Weſtly.
2	0 05	0 12	23 21	. . .	11 09 Amp. Weſtly.
	SOUTH.	SOUTH.			
3	1 05	0 53	24 19		
4	2 33	2 29	25 28	. . .	7 00 Amp. Eaſtly. 8 53 by 2 Azim.
5	4 12	4 11	26 20	. . .	6 30 Amp. Eaſtly. 6 13 by 2 Azim.
6	5 29	5 38	26 55	27 58	5 18 Azim. 5 30 Amp. Weſtly.
7	6 57	7 00	27 41	28 52	5 53 Amp. Eaſtly.
8	8 52	8 55	28 38	29 46	4 39 Amp. Eaſtly.
9	10 40	10 43	29 35	31 08	2 30 Amp. Weſtly. 1 53 by 4 Azim.
10	12 35	12 35	30 24	. . .	1 58 by 6 Azim. 1 54 Amp. Weſtly.
11	14 20	14 25	31 06	. . .	0 53 Amp. Eaſtly.
12	15 51	16 10	31 46	33 41	0 33 by 3 Azim. 0 24 Amp. Weſtly.
13	17 12	17 17	32 29	. . .	0 07 Amp. Eaſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Jan.	Above the freezing point.		
28	21,5	From E. to S. E. light breeze with ſqualls; wet weather.	On the 29th, met with a ſhip. Saw a quantity of oceanic birds, among others ſome *Boobies*.
29	21,5	From E. to S. S. E. ſlight ſqualls, calm at intervals; rain.	Till the 2nd of February, the ſhip was conſtantly followed by numerous ſhoals of *Tunnies* and *Bonitoes*; enough were caught for ſupplying all the ſhip's company at diſcretion: on the 2d ſaw a ſhoal of *Porpoiſes*, on the approach of which the *Tunnies* and *Bonitoes* diſappeared.
30	20,5	From S. E. to S. faint, ſqualls; rain, and weather overcaſt.	
31	21,0	S. E. Moderate; fine weather, cloudy at intervals.	
Feb.			
1	22,0	From S. to S. S. E. moderate; cloudy weather.	
2	22,0	S. E. by S. moderate; fine weather.	
3	23,0	S. E. ſteady freſh breeze; cloudy weather.	On the 3d, ſaw ſome *black Petrels* among other birds.
4	22,0	S. E. pleaſant breeze; fine weather.	
5	21,5	S. E. by S. moderate breeze; fine weather.	The 6, at 4h 47′ P.M. Long. by 4 ſets ☉ - ☾ — *M.* and *Ch.* 0 ′ ″ 28 04 22W.
6	21,5	E. S. E. moderate breeze; fine weather.	The 7, at 4h 14′ P.M. Long. by 2 ſets ☉ - ☽ — *M.* and *Ch.* 29 08 00W.
7	22,5	From S. E. to S. S. E. freſh; fine weather.	
8	22,0	S. E. by S. freſh breeze; fine weather.	The 8, at 4h 10′ P.M. Long. by 2 ſets ☉ - ☾ — *M.* . 30 01 00; *Ch.* . 29 55 00; Mean 29 58 00W.
9	22,0	From S. E. to E. S. E. moderate; fine weather.	The 9, at 5h 12′ P.M. Long. by 2 ſets ☉ - ☾ — *M.* . 31 32 00; *Ch.* . 31 05 00; Mean 31 17 30W.
10	21,5	E. S. E. moderate breeze; dull weather.	
11	22,0	E. S. E. ditto, ditto.	The 12, at 4h 19′ P.M. Long. by 4 ſets ☉ - ☾ — *M.* . 33 43 15; *Ch.* . 33 56 12; Mean 33 49 44; and a ſet ☾ — β Pollux. *Ch.* 33 50 14; Mean of the 5 ſets. . . 33 49 59W.
12	22,0	E. S. E. moderate; fine weather.	
13	23,0	From E. S. E. to E. N. E. faint; clear ſky.	

TIME.	LATITUDE by account SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Feb. 14	17 52	18 02	33 00		
15	18 39	18 53	33 28	35 56	0 24 Amp. Eaſtly 1 19 plus Azim.
16	19 51	20 01	34 12	37 06	2 19 Amp. Eaſtly 1 42 Azim.
17	21 12	21 21	34 51	. . .	3 00 Amp. Eaſtly 3 42 by 2 Azim.
18	23 02	23 22	36 13	. . .	4 00 Azim.
19	24 21	24 21	36 35		
20	25 04	24 55	37 04	. . .	5 14 Azim.
21	26 06	26 10	38 10	. . .	5 56 Azim.
22	27 35	27 44	39 35	. . .	8 16 ſev. Azim.
23	29 05	29 19	40 58		
24	30 28	. . .	42 12	. . .	10 10 by 6 Azim. 10 44 Amp. Weſtly.
25	31 25	31 45	43 17	47 56	10 45 Amp. Eaſtly. 11 15 by 6 Azim.
26	32 08	32 30	43 44	48 23½	11 12 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS. AND OBSERVATIONS.
Feb.	Above the freezing point.		
14	23,0	Variable, intervals of calm and rain; weather over-caſt.	On the 15th, at 8h 30′ P. M. Long. by 2 ſets ☾ - *Regulus* and *Aldebaran* — ☾ } *Ch.* . 36° 10′ 15″W.
15	22,5	E. N. E. light breeze; cloudy weather.	
16	22,0	From N. N. E. to N. E. moderate; fine weather.	On the 16th, at 9h 00′ P. M. Long. by 2 ſ. *Aldebaran* - ☾ and 1 ſet ☽ - *Regulus* } *M.* and *Ch.* } 36 54 06W.
17	23,0	N. E. by N. moderate; clear ſky.	
18	22,0	From N. N. E. to N. N. W. freſh; fine weather.	
19	22,0	From N. W. to S. E. round by the S. faint, ſqually at intervals; hazy weather.	On the 18th, ſaw a *Sea-ſwallow*.
20	21,0	From E. S. E. to E. light breeze; fine weather.	On the 20th, ſaw a *Booby*.
21	21,0	From E. to N. N. E. var. and ſqually; cloudy weather.	On the 21ſt and 22d, ſaw ſeveral *Sea-ſwallows* and a few *Boobies*.
22	21,5	From E. N. E. to N. E. pleaſant breeze; cloudy weather.	
23	21,5	From N. E. to N. N. E. moderate, dull weather; ſmall rain.	
24	20,5	From N. N. E. to N. moderate, ſqually from the N. W. weather over-caſt.	On the 24th, ſaw a number of *Petrels*.
25	21,5	From N. to N. E. faint, ſqually and calm at intervals; rain.	On the 25th, at 7h 4′ A. M. Long. by 6 ſets ☽ — ☉ } *M.* . 47° 46′ 35″ *Ch.* . 47 41 52 Mean 47 44 13W.
26	22,0	Calm, clear ſky; N. W. var. faint, cloudy weather.	On the 26th, at 8h 00′ A. M. Long. by 6 ſets ☽ — ☉. } *M.* . 48 37 55 *Ch.* . 48 09 05 Mean 48 23 30W.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Feb. 27	33 11	33 17	44 31	. . .	11 45 Amp. Eaſtly.
28	33 47	33 37	44 52		
March 1	33 53	33 48	44 06	. .	11 17 by 6 Azim.
2	34 54	34 50	43 18	.. .	12 01 by 6 Azim.
3	35 10	35 06	43 29	. . .	11 57 Amp. Eaſtly. 11 29 by 3 Azim.
4	36 03	. . .	44 40	. . .	12 03 Amp. Eaſtly.
5	37 44	37 39	46 09		
6	38 12	. . .	46 02		
7	37 27	36 35	46 39	. . .	11 42 Azim.
8	36 54	36 48	47 13	48 06	12 45 by 4 Azim. 12 20 Amp. Eaſtly.
9	37 34	38 00	49 47	. . .	14 10 Azim.
10	38 41	38 44	52 09	53 16	15 50 Amp. Eaſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Feb.	Above the freezing point.		
27	20,0	From N.W. by W. faint; clear weather to S.S.W. dark ſtormy weather.	On the 27th, ſaw a *Turtle* and ſome *Porpoiſes*; gray and brown *Petrels* were conſtantly ſeen.
28	18,0	From S. E. to S. by W. freſh; weather overcaſt, foggy.	
March 1	18,0	From S. to S. W. var. in ſqualls; cloudy weather.	
2	18,0	From S. W. by S. to S. S. E. faint; foggy weather.	On the 2nd, ſaw an *Albatroſs* and a number of *Petrels*.
3	18,5	From S. S. E. to N. W. round by the N. faint; fine weather.	
4	17,0	From N. N.W. to W. N. W. freſh, with ſqualls and rain.	On the 4th, ſaw ſome *Terns*.
5	16,0	From W.N.W. to S.S.W. ſtrong breeze and ſqually; rainy weather.	On the 5th, the chopping ſea and the whitiſh colour of the water announced ſoundings; founded without ſtriking ground at 120 fathoms.
6	14,7	S. W. ſqually; cloudy weather.	
7	16,5	From S.S.W. to W.N.W. light breeze and intervals of calm; fine ſky.	*Petrels*, both gray and brown and *Albatroſſes* were conſtantly in ſight.
8	17,5	From N. W. light breeze to N. N. W. freſh; fine weather.	On the 8th, at 3^h 52′ P. M. Long. by 4 ſets ☉ — ☽ — *M.* . 48° 08′ 00″; *Ch.* . 48° 42′ 00″; Mean 48° 25′ 00″ W.
9	17,0	From N. to S. E. round by the S. W. freſh; ſtormy weather and rain.	Still the ſame birds in ſight.
10	16,0	From S. E. pleaſant breeze to N. E. ſlight; clear weather.	On the 10th, at 3^h 56′ P. M. Long. by 4 ſets ☉ - ☽, and 2 ſets ☾ - β *Pollux*. — *M.* . 53° 40′ 11″; *Ch.* . 53° 40′ 19″; Mean 53° 40′ 15″ W.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
March 11	39 25	40 03	54 00	55 16	17 36 Azim.
12	40 52	40 48	55 01	56 28	16 32 Amp. Eaſtly. 17 00 Azim.
13	41 39	41 40	56 38		
14	41 30	41 15	56 14		
15	41 08	40 59	56 18	57 46	17 00 Amp. Weſtly.
16	41 14	41 01	56 24	. . .	19 00 Amp. Weſtly
17	42 06	42 04	59 12		
18	43 07	43 04	59 38	. . .	18 50 Azim.
19	43 17	43 15	58 50		
20	42 43	42 24	59 13		
21	42 49	42 28	59 46	. . .	18 11 Amp. Weſtly

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
March	Above the freezing point.		
11	14,5	From N. N. E. to N. W. freſh and faint by intervals, light fog; fine weather.	On the 11th, at 4^h 12′ P. M. Long. by 4 ſets ☉-☾, and 1 ſet ☾ — β *Pollux*. *M.* . 56 27 22 *Ch.* . 56 26 40 Mean 56 27 01W.
12	15,0	From W. S. W. faint to N.W. light; clear weather.	On the 12th, at 4^h 44′ P. M. Long. by 2 ſets ☉-☾ and 1 ſet ☾ — *Regulus*. *M.* . 56 34 00 *Ch.* . 56 39 00 Mean 56 36 00W.
13	11,5	From N. W. to S. S. W. ſtiff breeze, ſqually; fog and rain.	
14	11,0	From S. W. to S. S. W. ſtrong breeze, heavy ſqualls; clear weather.	
15	11,0	From S. W. freſh to S. E. faint; clear weather, dew at night.	On the 15th, at 8^h 15′ P. M. Long. by 2 ſ. ☾-*Regulus*. and *Aldebaran* - ☾. *Ch.* . 57 32 15W.
16	12,5	Calm, then N.N.W. pleaſant breeze; fine weather.	*Petrels*, *Albatroſſes*, and *Storm-birds*, were conſtantly ſeen: from the 12th to the 13th ſaw patches of *Sea-weed*, a *Duck*, a *white Antarctic Pigeon*, a *Penguin*, ſome *Mews*, and a few *Whales*.
17	13,7	From N. W. freſh, clear weather, to W. var. and faint; cloudy weather.	
18	10,5	From W. N. W. to S. W. ſtiff breeze; weather heavy at the horizon.	On the 17th, at 3^h 30′ P. M. 70 fath. fine gray ſand, with black and white ſpecks.
19	10,0	From S. W. to S. S. W. ſtrong breeze, heavy ſqualls; clear weather.	at 8^h 00′ P. M. 75 fath. fine gray ſand, with black and white ſpecks. On the 18th, ſaw a ſmall *Land-bird*, a *Port Egmont* Hen, a *Quebranta-hueſſos*, and the ſame birds as before.
20	11,5	From S. W. to N. N. W. moderate, intervals of calm; fine weather, dew at night.	
21	10,5	From W. to S. S. W. light fine weather, dew at night.	On the 21ſt, at 8^h 00′ P. M. 85 fathoms, fine gray, greeniſh ſand, with yellow, black and white ſpecks.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
March 22	42 17	42 05	60 54	. . .	18 05 Amp. Weſtly. 18 28 Azim.
23	43 14	43 26	62 01	62 15	19 15 Amp. Weſtly. 18 48 Azim.
24	44 05	44 00	63 02		
25	44 01	43 55	62 19	63 23	19 54 Amp. Weſtly.
26	45 33	45 37	63 45	. . .	19 54 by 3 Azim. 20 04 Amp. Weſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
March	Above the freezing point.		
22	13,0	From S. to N. N. W. light; fine weather, dew at night.	On the 22d, at 2h 00′ P. M. 65, at 8h 00′ P. M. 55, at 8h 00′ P. M. 55, at midnight. . . 60 fathoms, fine gray greenish sand, with yellow, black and white specks. Saw some *Seals* and a *Whale*.
23	14,5	From N. W. pleasant breeze to W. light and variable; fine weather.	On the 23d, at 7h 28′ A. M. Long. by 1 set ☽ — α of *Aquila*. *Ch*. . 61° 50′ 00″ W. On the 23d, at 8h P. M. 70 fathoms, very fine gray sand.
24	10,0	From S. S. E. to S. S. W. strong breeze squally; rain and hail, weather overcast.	On the 24th, saw a great many marine plants and a *white Antartic Pigeon*: for some days past saw other birds.
25	11,0	From S. faint and calm, to N.N.W. fresh; fine weather, foggy horizon.	On the 25th, at 8h A. M. 70 fathoms, gray, greenish sand, with yellow and white specks. On the 25th, at 8h 34′ A. M. Long. by 4 sets ☽ — ☉ *M*. . 63° 20′ 37″, *Ch*. . 63 25 23, Mean 63 23 00 W.
26	13,0	From N.N.W. to S.S.W. fresh and faint; fine weather.	On the 26th, at noon, 65 fathoms, fine gray sand. Saw *Seals*, *Whales*, *Porpoises*, heaps of marine plants, and the birds before denominated, in small numbers.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
March 27	47 05	47 05	64 30	64 48	21 00 Amp. Eaſtly.
28	48 00	47 55	64 54	65 08	
29	49 50	. . .	66 46	. . .	21 38 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
March	Above the freezing point.		
27	10,5	From N. W. to S. W. pleasant breeze; fine weather, var. calm and fog at night.	On the 27th, at 9h 01′ ⅔ A. M. Long. by 2 sets ☽ — ☉. *M.* and *Ch.* 0 ′ ″ 63 43 45W. On the 27th, at 4h P. M. 75 fathoms, greenish sand, mixed with black and white. at 8h P. M. 75 fathoms, gray, black and white sand, a little muddy. at 10h P. M. 80
28	12,0	From W. var. faint, to N. W. fresh and squally; weather overcast.	On the 28th, at 8h 27′ A. M. Long. by 4 sets ☽ — ☉, and 1 s. *Antares* - ☽ 0 ′ ″ *M.* . 65 05 30 *Ch.* . 65 07 00 Mean 65 06 15W. On the 28th, at 4h A. M. 80 fathoms gray and yellow sand. at 8h P. M. 82 fathoms, gray and yellow sand with rocks and shells. At midnight. . . 80 fath. gray greenish sand, mixed with yellow and black gravel. *Petrels*, *Albatrosses*, *Alcyons*, *Penguins*, and a few *white Antartic Pigeons*, together with *Seals*, *Porpoises*, and a few *Whales*, were seen daily.
29	11,0	West, variable, fresh breeze, more moderate; weather overcast.	On the 29th, we observed the sea to be covered with a species of *red Shrimps*.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
March 30	50 44	51 06	67 27	67 41	21 39 Amp. Eaſtly.
31	53 26	53 25	67 20	. . .	23 20 Azim.
April 1	54 07	53 56	66 45		
	Point of Departure within ſight of *Staten Land*.				
	. . .	53 56	. . .	66 08	
2	55 52	. . .	66 21		
3	56 25	. . .	66 12		
4	57 37	57 24	66 36		
5	57 27	. . .	66 58		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
March	Above the freezing point.		
30	9,5	From W. to N. N. W. pleasant breeze; clear weather.	On the 30th, at 4^h P. M. 90 { fath. yellow, black and white sand at 8^h P. M. 95 { fath. gray sand, and yellow gravel On the 30th, at 7^h 47′ A. M. Long by 2 f. ☽ - ☉, and 1 set *Antares* — ☽. { *M.* . 67 22 15 (° ′ ″) *Ch.* . 67 11 53 Mean 67 17 04W.
31	9,0	From N. N. W. to N. W. moderate breeze; fine weather, rainy.	On the 31st, at 8^h P. M. 90 fathoms, gravel, small pebbles and live shell-fish; at midnight and since, no bottom with 130 fathoms of line.
April 1	8,5	Calm till noon, then from N.W. to N.N.E. fresh; hazy weather.	On the 1st of April at noon, perceived *Staten Land* bearing S. S. W. distant 17 or 18 leagues.
2	5,5	From N. N. E. pleasant breeze; foggy weather, followed by a calm, and by a fresh breeze at S. W.	On the 30th and 31st of March, and 1st of April, saw a number of *Petrels*, *Albatrosses*, *Penguins*, *Divers*, and *white Antarctic Pigeons*, a great many *Seals*, *Whales*, and *Porpoises*; passed through a quantity of sea-weed in large patches.
3	5,2	From S. S. W. to W. strong breeze and violent squalls; accompanied by hail and snow.	On the 2d and 3rd, saw few birds of any species.
4	4,0	From W. to S. S. W. moderate, squally at times, followed by snow and hail; weather overcast.	On the 4th, saw some *spotted Petrels* for the 1st time, a *quebrantahuessos* and the same birds as before, but in small numbers.
5	3,5	From N. N. W. to S. light breeze, followed by a calm; weather overcast, rain and snow at intervals.	On the 5th, saw a great many *Petrels*, and some *spotted* ones, several were caught with hook and line: we continued to see these birds with *Albatrosses*, *Quebrantahuessos*, *Penguins*, *Alcyons*, and *Mews*, but in a small quantity.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
April 6	57 47	. . .	69 07		
7	58 15	. . .	71 08	. . .	26 04 Azim.
8	58 38	58 24	72 56		
9	59 13	59 14	75 47		
10	59 56	59 54	78 21		
11	59 44	59 44	79 09	77 03	
12	59 24	. . .	80 06		
13	59 54	. . .	82 34		
14	59 27	. . .	85 43		
15	58 02	58 38	86 28		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
April	Above the freezing point.		
6	1,5	From S. S. E. to S. E. pleasant breeze; weather, hail and hoary frost.	
7	1,7	From S. S. E. to N.N.E. light breeze; weather, dry.	
8	5,2	From N.N.E. to W.N.W. light breeze and fresh at intervals; weather overcast.	
9	5,0	From N.N.W. to W.N.W. moderate; cloudy and foggy, followed by squalls.	
10	6,0	From W.N.W. to N. W. fresh, accompanied by squalls; foggy weather.	
11	3,5	From S. S. W. to W. stiff breeze; squalls, small rain.	On the 11th, at 4^h 15′ P. M. Long. by 2 sets ☉ — ☾. *M.* and *Ch.* 77 08 00W.
12	4,5	From W. to N. N. W. fresh in squalls; fog and small rain.	*Spotted Petrels*, *gray Petrels*, *Albatrosses*, were constantly seen, and from time to time *Quebrantahuessos*, *Penguins*, *Mews* and *Sheer-waters*; *spotted* and *gray Petrels* were frequently caught with hook and line.
13	4,5	From N. W. by W. to N.N.E. fresh breeze; weather overcast and rainy.	
14	5,0	N.N.W. moderate; S.W. strong gale, accompanied by heavy squalls; foggy weather.	
15	2,5	From S. W. to E. fresh in squalls; followed by snow and hail.	

TIME.	LATITUDE by account SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
April 16	57 43	57 46	86 46	. . .	23 30 by 16 Azim.
17	56 27		88 08		
18	54 05	54 45	91 15		
19	52 32	52 33	93 16	93 19	16 34 plus Azim.
20	51 38	51 38	94 02	. . .	15 30 plus Azim.
21	50 19	. . .	95 57		
22	50 13	. . .	97 03		
23	50 22	50 39	96 55		
24	48 50	48 49	95 37	95 18	
25	46 07	46 08	95 42	96 09 or 95 46 by a mean between the obſervations of the 24th and thoſe of the 25th.	11 14 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
April	Above the freezing point.		
16	5,0	From S. W. to N. N. E. variable, light breeze; fine weather, foggy in the horizon.	
17	2,7	From S. E. to S. ſtrong gale in ſqualls, followed by ſnow and hail; weather overcaſt and rainy.	
18	3,0	From S. S. E. to S. S. W. ſtrong gale and ſqually; ſame weather.	
19	2,0	From W.S.W. to S.S.W. freſh, and ſqualls followed by ſnow and hail; cloudy weather.	On the 19th, at 9^h 20′ P. M. Long. by 1 ſet of *Spica Virginis* — ☾ . . . . } *Ch.* 0 ′ ″ 93 44 00W.
20	5,0	From S. S. E. light hazy weather; to N. E. by N. freſh; cloudy weather.	
21	6,0	From N. E. to N. N. E. violent and heavy ſqualls; weather foggy and rainy.	On the 21ſt, in the morning, forced to lie to by a boiſterous wind and a very heavy ſea, which occaſioned the ſhip to labour extremely.
22	7,5	From N by E. to N.N.W. pleaſant breeze; foggy weather.	
23	7,0	From N. W. by N. to W. by N. ſtrong breeze, ſqually; weather overcaſt.	On the 24th, at 8^h 35′ A. M. Long. by 2 ſets ☽ — ☉. } *M.* and *Ch.* 0 ′ ″ 95 28 30W.
24	7,0	From W. to W. S. W. freſh breeze, and clear weather.	On the 25th, at 9^h 23′ A. M. Long. by 2 ſets ☽ — ☉ } *M.* and *Ch.* 96 09 30W
25	7,5	From W. to S. W. freſh breeze in ſqualls, and clear weather.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
April 26	43 46	. . .	96 58		
27	43 02	. . .	97 23		
28	42 31	. . .	98 45		
29	41 30	. . .	100 24	. . .	10 10 Amp. Eaſtly.
30	40 24	40 20	100 45	. . .	7 41 by 15 Azim.
May 1	39 55	39 59	100 02	. . .	7 29 Azim.
2	38 21	38 29	100 53		
3	36 34	36 33	100 44		
4	35 04	. . .	99 30		
5	33 57	33 56	100 10		
6	33 14	. . .	100 41	. . .	7 56 by 12 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
April	Above the freezing point.		
26	8,0	From S. W. by S. to S.W. fresh breeze; cloudy weather.	On the 26th, saw a *Port Egmont hen*; saw also the same sort of birds as before.
27	9,5	Puffs from the W. N W. hazy weather: then from N. N. E. to N. light breeze.	
28	11,0	N. by E. pleasant breeze; weather overcast.	
29	11,0	From N.N.E. to E.N.E. light breeze; foggy weather, small rain.	On the 29th, saw a numerous flight of birds of the *Tern* species, going towards the S. W.
30	11,5	From W. by N. to N. W. by N. light breeze; fine weather.	From the 30th to the 4th, saw only some *spotted Petrels* and some *Albatrosses*: their number diminished every day.
May 1	12,0	From N N.W. to S. round by the E. var. fresh, squalls followed by rain and snow; stormy weather.	
2	11,5	From S.S.W. to W. fresh breeze in squalls; weather overcast.	
3	14,0	From W. to N. W. by W. stiff breeze squally; weather overcast.	
4	14,5	From N. W. to S. S. E. round by the W. fresh and squally; foggy weather and small rain.	On the 4th, saw a *Port Egmont hen*.
5	16,0	From S. to N. E. var. light breeze; cloudy weather.	From the 5th, we no longer saw either *spotted Petrels*, or others, nor *Albatrosses*.
6	16,5	From N. N. E. to N. W. by W. fresh in squalls; weather overcast.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
May 7	31 54	31 40	99 33	. . .	8 07 plus Azim.
8	30 23	30 25	98 45	96 44	9 00 Azim. 8 34 Amp. Weſtly.
9	30 06	30 02	98 42	96 55 or 96 48 by a mean between the 8th and 9th	9 17 plus Azim.
10	29 21	29 33	100 00		
11	29 09	29 09	100 34	. . .	6 33 by 8 Azim.
12	28 27	28 25	100 35	98 51	6 32 by 5 Azim.
13	27 01	27 00	101 25		
14	25 17	25 30	103 02	. . .	7 21 by 3 Azim.
15	25 07	25 20	104 24		
16	25 16	25 29	105 27	. . .	6 47 by 4 Azim.
17	25 32	25 36	106 25	. . .	6 39 by 4 Azim.
18	25 39	25 44	107 15	. . .	6 26 plus Azim.
19	25 27	. . .	107 24	. . .	5 50 Amp. Eaſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
May	Above the freezing point.		
7	19,0	N. W. by W. pleasant breeze; fine weather.	
8	20,0	N. W. light breeze, fine weather.	On the 8th, at 2h 48′ P. M. Long. by 2 sets ☉ — ☾. *M.* and *Ch.* 96 33 00W.
9	21,0	From W. N. W. faint to N. by E. fresh breeze; fine weather.	On the 9th, at 4h 7′ P. M. Long. by 2 sets ☉ — ☾. *M.* and *Ch.* 97 08 00W.
10	20,0	From N. E. by N. to N. N. W. in strong squalls; clear weather.	
11	20,5	From W. N. W. to W. by S. faint and squally; cloudy weather.	On the 9th, saw a *Whale*, a *Sea-swallow* and a *Mew*. On the 10th, saw some *Sea-swallows*.
12	18,0	From W. to S. light breeze; fine weather.	On the 12th, saw a *Man-of-war-bird*. On the 12th, at 3h 20′ P. M. Long. by 2 sets ☉ — ☾. and 2 s. ☽ - *Spica* ♍ *M.* and *Ch.* 98 54 00W.
13	20,0	S. E. pleasant breeze; fine weather.	
14	20,0	From E. S. E. to N. by W. moderate, accompanied by squalls; weather overcast.	On the 13th, 14th and 15th, saw some *Sea-swallows*.
15	20,0	From N. to N. N. W. light, squally; weather overcast.	
16	20,5	From N. to N. by W. faint breeze; cloudy weather.	On the 16th, saw some *Bonitoes* and two *gray Terns*.
17	21,0	From N. to N. N. W. faint; cloudy weather.	On the 17th, saw two *Tropic-birds*.
18	21,0	From N. by W. to N. W. by N. faint breeze; fine weather.	From the 18th, saw constantly *Man-of-war-birds*, red-shafted *Tropic-birds* and others, also now and then some *Mews* and *Bonitoes*.
19	19,5	From W. to N. E. by E. round by the S. almost calm; cloudy weather.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
May 20.	24 49	24 47	108 09	. . .	5 48 by 3 Azim.
21	24 00	24 06	109 26	. . .	6 34 plus Azim.
22	24 00	23 59	109 53	. . .	6 07 Azim.
23	23 03	23 05	110 30	111 56	5 32 Azim. 5 26 Amp. Eaſtly.
24	21 44	21 54	111 37	113 41	4 05 by 6 Azim.
25	20 49	21 03	112 47	114 57	5 40 by 5 Azim.
26	20 24	20 22	113 02	115 38	5 25 by 8 Azim.
27	19 28	19 32	114 10	116 34	5 24 by 5 Azim.
28	19 20	19 20	114 22	. . .	5 56 Azim. 5 32 Amp. Weſtly.
29	18 46	18 46	115 26	. . .	5 32 Amp. Eaſtly.
30	19 05	19 09	116 23		
31	18 41	18 36	116 10		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
May	Above the freezing point.		
20	21,5	From N. by E. to N. E. by N. light breeze; cloudy weather.	
21	22,5	From N. E. by N. to N. by W. light, followed by a calm; fine weather.	
22	23,0	From N. W. by N. to N. E. by N. faint, calm at intervals; fine weather.	On the 23rd, saw a great many *Flying-fishes*.
23	24,0	From E. to E. S. E. fresh breeze; fine weather.	On the 23d, at 8h 31′ A. M. Long. by 6 sets ☽ — ☉ } *M.* and *Cb.* } ° ′ ″ 111 45 30W.
24	23,5	From N. E. by N. to E. N. E. moderate; cloudy weather.	On the 24th, at 10h 3′ A. M. Long. by 2 sets ☽ — ☉ } *M.* and *Cb.* } 113 34 00W.
25	24,0	From E. S. E. to S. E. faint; fine weather.	
26	24,0	S. E. faint; fine weather.	On the 25th, at 8h 34′ A. M. Long. by 2 sets *Antares* - ☽ and 2 sets ☽ — ☉ } *M.* and *Cb.* } 114 49 00W.
27	23,0	From S. E. to N. E. light breeze, followed by calm; fine weather.	
28	24,0	Calm, then from N. E. to N. N. E. faint; fine weather.	On the 26th, at 8h 12′ 44″ A. M. Long. by 2 sets ☽ — ☉ } *M.* and *Cb.* } 115 32 15W.
29	22,0	From N. N. E. to N. W. pleasant breeze; cloudy weather.	On the 27th, at 7h 41′ A. M. Long. by 1 set α of *Aquila* — ☾, and 2 sets ☽ — ☉. } *M.* and *Cb.* } 116 23 30W.
30	24,0	From N. to W. accompanied by squalls; weather overcast.	
31	23,0	From N. W. to S. W. squalls; weather rainy, overcast.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
June 1	18 06	. . .	116 16		
2	17 39	17 36	116 22	. . .	4 50 by 3 Azim.
3	15 51	15 47	117 49		
4	14 09	14 13	120 02	. . .	3 10 by 12 Azim.
5	13 08	13 11	122 21	. . .	2 43 by 6 Azim.
6	12 09	12 10	124 33	127 10	3 07 by 10 Azim.
7	11 09	11 12	126 47	129 25	4 03 by 6 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
June	Above the freezing point.		
1	21,0	From N. N.W. to S.S.W. faint, intervals of calm; ſtormy weather.	On the 1ſt and 3rd, ſaw ſome *Porpoiſes*.
2*	21,0	Calm, then from S.W. to S. pleaſant breeze; hazy weather.	* It may be remarked, that between the tropics, the winds do not always blow from the *Eaſt* quarter; for it is ſeen that, from the 29th of May to the 3rd of June, between the parallels of 18° 45′ and 15° 45′ ſouth, the *Solide* had, for five days, winds—from North to Weſt—from North-Weſt to South-Weſt, in ſqualls;—from North-North-Weſt to South-South-Weſt—from South-Weſt to South: this explains how the weſtern iſlands may have had and may ſtill have a communication with the iſlands ſituated, in regard to them, to the *Eaſt* and to the *North*. This remark is confirmed by the *Journals of the Route* of all the navigators who have croſſed the *Great Ocean* between the tropics.
3	21,5	From S.S.E. to S.E. by S. pleaſant breeze; hazy weather.	
4	23,0	S. E. freſh breeze; fine weather.	
5	23,0	From E. S. E. to S. E. freſh breeze; fine weather.	*Red-ſhafted Tropic-birds* and others, and *Flying-fiſhes* were conſtantly ſeen, and from time to time *Boobies*, *Man-of-war-birds*, *Sheer-waters*, *Sea-ſwallows* and *Bonitoes*. On the 5th, ſaw a ſmall *Tern*.
6	24,5	E. S. E. pleaſant breeze; fine weather.	On the 6th, at 4h 23′ P. M. Long. by 4 ſets ☉ — ☽, and 2 ſets ☽ — to *Spica Virginis*. *M.* and *Ch.* 0 ′ ″ 117 33 00W.
7	24,0	E.S.E. moderate breeze; fine weather.	On the 7th, at 3h 26′ 33″ P. M. Long. by 2 ſets ☉ — ☾, *M.* and *Ch.* 129 42 15W.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs EAST.
1791.	° ′	° ′	° ′	° ′	° ′
June 8	10 17	10 18	128 39	131 08	4 37 by 8 Azim.
9	9 45	9 46	130 34	. . .	4 52 by 6 Azim.
10	9 48	9 45	132 30	135 52	5 38 by 10 Azim.
11	9 49	9 59	133 20	. . .	4 18 Amp. Eaſtly.
12	9 54	9 59	136 01	. . .	5 50 by 6 Azim.
	Point arrived at within ſight of the *Marqueſas*.				
	. . .	9 59	. . .	140 29	
13	Lying to off the Bay of *la Madre de Dios* in the Iſland of *Santa Chriſtiana*.				
14					
15					
16					
17	At anchor in the Bay of *la Madre de Dios*.				
					In the Bay.
18	. . . . .				3 18 30 by 8 Azim. 4 15 00 Amp. Eaſtly.
19	. . . . .				3 09 45 by 8 Azim. 2 49 00 Amp. Eaſtly
	Point of Departure from the Bay of *la Madre de Dios*.				
20	. . .	9 55½	. . .	141 29	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
June	Above the freezing point.		
8	25,0	From E. S. E. to S. E. moderate; fine weather.	On the 8th, at 3^h 2′ 17″ P. M. Long. by 2 sets ☉ — ☾, and 2 sets ☽ — to *Spica Virginis* . . . . *M.* and *Ch.* 131 23 00W.
9	25,0	From E. S. E. to S. E. moderate; cloudy weather.	
10	23,5	From E.S.E. to E. light; fine weather.	The same birds were still seen, and *Terns* besides.
11	25,0	From E. to E. S. E. light breeze; fine weather.	On the 10th, saw some *Flying-fishes* with *four red wings*, the first that were seen of this species.
12	25,0	From E. N. E. to E. by S. moderate; fine weather.	On the 10th, at 4^h 45′ 34″ P.M. Long. by 8 sets ☉ — ☾, 2 sets ☽ — *Antares*, 2 sets *Regulus* — ☾. *M.* . 136 10 55; *Ch.* . 136 14 55; Mean 136 12 55W.
13	25,5	Variable, calm; fine weather.	
14	26,0	N.N.E. fresh breeze, followed by a calm; fine weather.	On the 11th and 12th, saw a number of birds of every species of those before-mentioned.
15	27,0	From N. E. to E. N. E. light breeze, followed by a calm; fine weather.	On the 12th at ½ past ten, A. M. perceived the Island of *La Madalena*, one of the *Marquesas*, bearing S. W. by S.: at noon it bore S. W. and the Island of *San Pedro* West, distant 14 leagues.
16	25,0	E.N.E. fresh breeze; fine weather.	
17	24,0	N. E. accompanied by squalls; calm, and rain at intervals.	On the 14th, at 8 A. M. anchored in the Bay of *La Madre de Dios* in the Island of *Santa Christiana*.
18	25,0	N.E. in puffs, and squalls of rain; fine weather.	
19	24,0	From N. E. to N. N. W. accompanied with sudden squalls; cloudy weather.	
20	24,0	From N. N. W. to N. E. ditto.	On the 20th, at 11 P. M. took our departure from the Bay of *La Madre de Dios*.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
June 21	In ſight of *Ile Marchand*, one of the *Iſlands diſcovered.*				*At ſea.* 4 32 by Azîm.
	9 25	. . .	142 25	. . .	
22	9 21	9 21	142 30	142 27	
23	In ſight of *Ile Baux.*				
	8 54	8 50	142 46		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
June	Above the freezing point.		
21	24,0	From E. to S. E. moderate; fine weather.	On the 21ſt, at day-break, ſaw to the N. W. a high iſland which was named *Ile Marchand*; at noon, the weſtern extremity of this iſland bore N. by W. 2° W: a point, named *Pointe de l'Obéliſque*, *Obeliſk* Point, S. E. by E. 2° E.
22	25,5	From S. E. to E. N. E. accompanied by ſqualls and rain at intervals; clear weather.	On the 22d, at 7h 23′ A. M. by 6 ſets ☽ — ☉, and 2 ſets α of *Aquila* — ☾. Long. M. and Ch. 142° 25′ 00″ W. Lat. 9° 20′ S. The centre of *Marchand*'s Iſland then bearing E. S. E. 4°.30′ S. diſtance from the ſhore 14 miles.
23	26,5	From E. by N. to E. pleaſant breeze; fine weather.	On the 23rd, at noon, an iſland diſcovered the day before, which had been named *Ile Baux*, bore from E. 6° N. to E. S. E. 2° S. diſtant 6 ½ leagues; and two iſlots or rocks, diſcovered in the morning which had been named *les Deux Frères*, bore from N.W. 7° N. to N.N.W. 6° W. 3 or 4 leagues. During the whole day of the 23rd, we thought we ſaw other lands from South-Weſt to Weſt; the horizon in that quarter remained conſtantly charged with large clouds heaped together.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
June 24	In ſight of *Ile Maſſe* and *Ile Chanal*. 7 44	7 54	143 06	143 10	
25	5 54	5 42	143 27	143 49	5 32 by 8 Azim.
26	3 24	3 14	143 21	. . .	5 06 by 4 Azim.
27	1 17	1 02	143 12	. . .	5 07 Azim.
28	NORTH. 0 19	NORTH. 0 06	143 12	. . .	5 04 by 4 Azim.
29	1 06	1 16	143 51	. . .	5 20 Azim.
30	3 11	3 11	144 15	. . .	5 08 by 7 Azim.
July 1	4 54	. . .	144 15		
2	6 08	6 18	144 30		
3	7 05	7 10	144 38	. . .	4 54 by 6 Azim.
4	7 21	7 23	144 31	. . .	5 27 Amp. Eaſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
June	Above the freezing point.		
24	27,0	From E. to E. N. E. pleasant breeze; fine weather.	On the 24th, at 10h 40′ A. M. Long. by 2 sets ☽ — ☉ M. and Ch. 143° 08′ 00″ W. Lat. 8° 1′ S
25	27,5	From E. to E.S.E. pleasant breeze; fine weather.	An island discovered the day before, which had been named *Ile Masse*, then bore from E. by N. 1° N. to S. E. 1° E. 5 leagues; another island discovered in the morning, and which was named *Ile Chanal*, bore from E. N. E. 1° E. to E. by N.
26	24,5	From E. S. E. to E. by N. with squalls and rain.	
27	24,0	From E. S. E. to N. E. moderate breeze; fine weather.	
28	25,0	From E. S. E. to E. by N. light breeze; fine weather.	On the 22nd, 23rd, and 24th, saw a number of *Boobies*, *Man-of-war-birds*, and some *large flying-fishes with two red wings*.
29	24,0	From E. S. E. to N. E. moderate breeze; fine weather.	On the 25th, at 8h 53′ A. M. Long. by 2 sets ☽ — ☉ M. and Ch. 143° 48′ 00″ W.
30	25,5	From E. by N. to E.N.E. fresh breeze; fine weather; intervals of squalls, followed by showers of rain.	On the 25th, 26th, and 27th, saw few birds, only some *Tropic-birds*.
July			
1	23,5	From E.N.E. to E. S. E. moderate; squally; weather overcast.	On the 28th, in the afternoon, saw a great number of every species, which directed their flight to the S. E.: this very day, at ½ past 6 P.M. an appearance of land was seen to the W. by S. 5° W.; we steered to the westward till 1 A. M. and we spent the rest of the night lying to; but, at day-light, we saw nothing. Till the 30th, we continued to see a great number of *Tropic-birds*, *Sea-swallows*, *Terns*, and a few *Porpoises*.
2	23,0	From N. E. to S. E. var. accompanied by squalls; weather overcast, stormy.	
3	22,0	From S. E. to S. faint; rainy, accompanied by calm; stormy weather.	
4	25,5	Var. and calm, fine weather, then S. S. E. light breeze; misty weather.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
July 5	8 22	8 33	144 23	. . .	5 48 by 3 Azim.
6	10 15	10 21	144 10		
7	11 36	11 42	143 41	. . .	6 15 Amp. Weſtly.
8	12 36	12 32	144 50	. . .	6 33 by 8 Azim.
9	13 31	13 28	146 05		
10	14 23	14 29	146 44	. . .	6 58 by 4 Azim.
11	16 08	16 17	147 42		
12	18 05	18 11	148 17	. . .	8 18 by 2 Azim.
13	20 05	20 04	149 12	. . .	9 02 by 2 Azim.
14	21 58	22 01	150 13	. . .	9 45 by 4 Azim.
15	23 47	24 03	151 18	. . .	10 27 by 4 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
July	Above the freezing point.		
5	26,0	From S. to W. N. W. light breeze; followed by ſqualls and rain.	On the 5th, in the afternoon, paſſed the trunk of a tree which appeared not to have been long in the water.
6	25,0	From W. to S. E. round by the S. pleaſant breeze; accompanied by ſqualls at intervals.	
7	22,0	From E. to N. E. light breeze, followed by calm; weather overcaſt and miſty.	
8	23,5	From N. E. to N. N. E. pleaſant breeze; fine weather.	
9	24,0	From N. N. E. to N. E. pleaſant breeze; ſqualls and rain at intervals.	
10	23,5	From S. S. E. to N. E. moderate and freſh in ſqualls; miſty weather.	
11	23,0	From N. E. to E. N. E. freſh in ſqualls; miſty weather.	Since the 10th, we have ſeen but a very ſmall number of birds.
12	21,5	From E. N. E. to N. E. by N. freſh in ſqualls; cloudy weather.	
13	21,5	From N. E. by E. to N. E. freſh breeze; ſhowers of rain at intervals.	On the 13th, ſaw a *Turtle*, ſome *Doradoes*, and a few *Tropic-birds*.
14	22,0	N. E. by E. pleaſant breeze; fine weather.	
15	22,0	From N. E. by E. to N. E. by N. freſh breeze; fine weather.	On the 15th, ſaw a number of *Terns*, and *Flying-fiſhes with two red wings*.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
July 16	25 53	25 58	152 38		
17	27 42	27 42	153 53		
18	28 36	28 36	154 41	. . .	11 48 Amp. Eaſtly. 11 39 by 5 Azim.
19	28 40	28 40	153 46	. . .	12 21 by 11 Azim.
20	28 53	28 42	153 54	156 02	13 07 by 6 Azim. 13 32 Amp. Weſtly.
21	29 36	29 36	153 29		
22	30 47	30 52	152 53	. . .	13 26 by 8 Azim.
23	32 04	32 10	152 14	154 25	
24	33 44	34 05	151 19	153 32	14 37 Amp. Weſtly. 14 53 Azim.
25	35 44	35 51	150 19	. . .	15 30 Azim.
26	37 41	37 49	149 47	152 17	16 24 Amp. Weſtly.
27	39 35	39 48	149 12	. . .	16 50 by 3 Azim.
28	41 26	41 35	148 34	. . .	16 54 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
July	Above the freezing point.		
16	20,0	N. E. fresh breeze; weather overcast, squalls at intervals.	On the 20th, at 7h 34′ A. M. Long. by 4 sets ☽ — ☉ } *M.* and *Ch.* } ° ′ ″ 156 06 00W.
17	20,0	From N. E. by E. to N. E. by N. pleasant breeze; cloudy weather.	On the 20th, saw a *Tropic-bird*, a *Quebrantahuessos* or *Giant-Petrel*, a *Shark*, and some *Porpoises*.
18	20,5	From N. N. E. to W. faint, intervals of calm; cloudy weather.	From the 21st to the 23rd, saw some *Alcyons*, *Quebrantahuessos*, *Bonitoes*, and *Porpoises*, and passed some sea-weeds: we still saw a few *Tropic-birds* till the 24th.
19	20,0	N.N.E. var. faint; small rain at intervals.	
20	19,5	Calm and puffs, variable; fine weather.	On the 23rd, at 7h 34′ A. M. Long. by 4 sets ☽ — ☉ } *M.* and *Ch.* } ° ′ ″ 154 35 00W.
21	20,2	From S. E. to S. W. var. light breeze; squalls at intervals; cloudy weather.	On the 24th, at 8h 4′ A. M. Long. by 2 sets ☽ — ☉ } *M.* and *Ch.* } 153 42 00W.
22	20,5	From S. S. E. to S. light breeze; cloudy weather.	We daily saw *Alcyons*, *Storm-birds*, *Sea-swallows*, *Petrels*, and a few *Quebrantahuessos*.
23	21,5	From S. S. E. to E. S. E moderate breeze; cloudy weather.	On the 26th, at 8h 21′ 20″ A. M. Long. by 2 sets ☽ — ☉ } *M.* and *Ch.* } 152 19 00W.
24	20,5	From S. E. by E. to E. by S. moderate; fine weather.	On the 26th and 27th, passed by a quantity of floating substances, of the form of rushins, and of a brown colour; saw some *Mollusca*.
25	19,0	From E. S. E. to E. by N. pleasant breeze; cloudy weather.	
26	17,5	From E. to S. E. moderate breeze; dull weather.	
27	16,5	From E. by N. to E. by S. moderate; dull weather.	On the 28th, in the morning, saw a number of *Gulls*, *Sea-swallows*, and several flights of other birds, which appeared to be land-birds; we also saw some *Mollusca*.
28	15,5	From E. by N. to S. E. light breeze; cloudy weather.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
July 29	42 22	42 37	148 14	. . .	17 24 by 4 Azim.
30	43 03	43 02	148 07	. . .	18 13 plus Azim.
31	43 53	44 01	147 30		
Auguſt 1	46 29	. . .	146 44		
2	48 42	48 44	145 51		
3	50 26	. . .	145 11		
4	53 06	. . .	144 34		
5	55 04	55 12	142 20	143 46	23 30 plus Azim.
6	56 38	. . .	139 14		
7	56 57	57 20	138 30		
	At 6 P. M. Time of taking the bearing of Cape *del Engaño*.				
	56 52	57 18	138 01½	139 26½	
8	56 57	57 12	Playing to windward or becalmed in ſight of the Coaſt.		24 63 by 12 Azim.
9	56 49	57 05			

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
July.	Above the freezing point.		
29	18,0	From E. to S. S. W. faint, followed by a calm; fine weather.	On the 29th, saw a *Sea-leek* (*Fucus giganteus*); we also saw the same species of birds.
30	15,0	From E. N. E. to W. N. W. round by the S. faint; fine weather.	On the 30th and 31st, saw some *Whales* and *Sea-leeks*.
31	15,0	W. Moderate and then fresh; weather overcast.	On the 1st of August passed a root of a tree.
August 1	12,0	From W. S. W. to W. N. W. stiff breeze; weather overcast and misty.	On the 3rd and 4th, passed several *Sea-leeks*; and a few leaves of the species of sea-weed, called *Alga marina*. On the 4th, saw a large piece of wood floating, and a flight of small land-birds. We daily saw besides *Quebrantahuessos*, *Petrels*, *Sea-swallows*, *Gulls*, and *Storm-birds*.
2	10,3	From W. to W. S. W. strong gale; weather overcast and foggy.	
3	9,7	From W.S.W. to S.S.W. fresh; weather overcast and foggy.	On the 5th,
4	9,0	From S. by W. to S. E. fresh, accompanied by squalls; weather overcast.	at $2^h\ 12'\ 12''$ P.M. Long. by 4 sets ☉—☾ *M.* and *Ch.* ° ′ ″ 143 29 41 W.
5	12,0	From S. by W. to S. E. fine breeze; cloudy weather.	On the 6th, saw some *Auks*, and a quantity of *Sea-leeks*.
6	10,5	From S.E. to N.E. fresh; followed by squalls; weather misty and rainy.	On the 7th, passed a piece of wood, a quantity of *Sea-leeks*, and other sea-plants. Saw a *Whale*, some *Auks*, and some *Mews*: the water has a greenish colour. This day at $5\frac{1}{2}$ P.M. perceived the coast of *America*, and at 6^h set *Monte San Jacinto* E.S.E. 3° E. at the distance of 14 or 15 leagues.
7	12,0	From E. N. E. to S. faint; weather dull and misty.	
8	10,5	From S. W. to E. S. E. var. faint; weather dull and foggy.	On the 8th, at noon, the extremity of Cape *del Engaño* bore E.S.E. 2° S. The Mountain E. by S. 4° S.
9	10,0	From S. W. to S. E. by S. var. light; weather overcast and misty.	On the 9th, at noon, the point of Cape *del Engaño* bore E. by S. 4° S.; the mountain E. 4° S.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Auguſt 10	57 00	57 00	Plying to windward, or becalmed in ſight of the coaſt.		
11	57 00	57 00	At the mouth of the Bay of *Tchinkitânay*.		28 46 plus Azim.
12					
13					
14	. . .	57 04	. . .	137 59	
15					
16	At anchor in the Bay of *Tchinkitânay*.				
17					
18					
19					
20					
	Point of Departure from the Bay of *Tchinkitânay*.				
21	. . .	57 04	. . .	137 59	29 30 Amp. Weſtly.
22	54 38	54 35	137 16	137 10	29 00 Amp. Eaſtly. 28 02 Azim.
23	. . .	54 04	Longitude of the place whence the bearing was taken.	136 01	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
August	Above the freezing point.		
10	11,5	Calm, then from N. W. to N.N.W. light; fine weather.	On the 10th, at noon, the point or pitch of Cape *del Engaño* bore E. 6° N. distant 2 ½ leagues.
11	15,5	From N. W. light to S. S. W. faint; clear weather.	
12	10,0	From S. S. W. to S. E. var. almost calm; rain.	On the 12th, at 10h A. M. anchored in the Inlet of *Tchinkitânay*.
13	10,5	S. S. E. fresh, then faint; small rain.	While we were in sight of Cape *del Engaño*, we constantly saw *Divers*, *Auks*, *Whales*, *Seals*, *Porpoises*, and different sea-fowl.
14	10,5	E. S. E. ditto; weather foggy with small rain.	
15	11,5	From S. S. E. to S. S. W. faint; dull weather.	
16	12,5	Puffs from N. to S. faint; fine weather.	
17	10,5	From S. S. E. to S. light breeze; thick weather; continual rain.	On the 21st, got under way from *Tchinkitânay* Bay. At noon, Cape *del Engaño* bore N. W. 6° W.
18	11,5	N. W. light; fine weather, followed by calm and fog.	On the 22d,
19	10,0	S. S. E. moderate; weather foggy and rainy.	at 9h 20′ A. M. Long. by 2 sets ☽ — ☉. *M.* and *Ch.* 137° 31′ 30″ W.
20	11,5	From S.S.E. to W.S.W. var. light; fine weather.	On the 22d, at noon, the coast of *America* extended from E. N. E. to E. distant 18 leagues.
21	10,2	Var. light; then from S. W. to N. W. fresh breeze; fine weather.	At 7 P. M. *Queen Charlotte's* Islands S. E. 8 or 9 leagues.
22	11,5	N. W. fresh breeze and clear weather.	On the 23d, at noon, the north extremity of the most northern of *Queen Charlotte's* Islands bore N. E. 6° N; a small island on the coast of the large island of that name, S. 2 or 3° E.
23	11,2	W. N. W. light breeze; fine weather, followed by a calm.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Auguſt 24	. . .	54 18	Standing under eaſy ſail, and frequently lying to, in ſight of the weſt coaſt of *Queen Charlotte*'s Iſlands, while the long-boat was viſiting the coaſt.		
25	. . .	54 22			
26	. . .	54 29			
27	. . .	54 15			
28	. . .	53 55			
29	. . .	53 40			
30	. . .	53 28			
31	. . .	53 25			
Sept. 1	Point of departure from *Queen Charlotte*'s Iſlands. . . .	52 56	. . .	135 35	26 50 Azim.
2	50 59	. . .	135 10	. . .	25 16 Amp. Weſtly.
3	50 00	49 49	133 07		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
August	Above the freezing point.		
24	11,2	From W. N. W. to W. by S. gentle breeze; fine weather.	On the 24th, at noon, the moſt northern of *Queen Charlotte*'s Iſlands bore from S. E. by S. to E. S. E.; the entrance of *Cloak* Bay S. E. by S. 2° ½ S.
25	12,5	From W. S. W. to W. N. W. faint breeze; fine weather.	On the 25th, at noon, the north point of the moſt northern of *Queen Charlotte*'s Iſlands bore S. E. 6° E. *Cloak* Bay, S. E. by E. 3° S.
26	13,0	From W. to N. N. W. faint and calm; fine weather.	On the 26th, at noon, the north point of the moſt northern of *Queen Charlotte*'s Iſlands bore S.E. 6° E. *Cloak* Bay, S.E. by S.
27	13,0	From N.W. to N.E. faint and calm; fine weather.	On the 27th, at noon, the ſame bay bore S. S. E ½ E. the north point of the moſt northern of *Queen Charlotte*'s Iſlands E. by S.
28	13,5	From W.N.W. to N. W. moderate breeze; fine weather.	On the 28th, at noon, *Queen Charlotte*'s Iſlands bore from N. E. by N. to S. E. by S. 4 leagues.
29	13,5	From W. N. W. to N. N. W. moderate breeze; fine weather.	On the 29th, at noon, an *Iſlot* on the coaſt of *Queen Charlotte*'s Iſlands bore N. by E.; the moſt ſoutherly land in ſight S. E.
30	12,5	Ditto, freſh breeze, and fine weather.	On the 30th, at noon, *Hippah* Iſland bore N. E. 5° E. diſtant about 4 miles.
31	11,0	From N. W. to W.N.W. freſh breeze; fine weather.	On the 31ſt, at noon, *Hippah* Iſland bore N. E. 6° N. diſtant 5 or 6 miles.
Sept.			
1	11,5	From N. W. to W.N.W. moderate breeze; fine weather.	On the 1ſt of September, at noon, the extremity in ſight of *Queen Charlotte*'s Iſlands bore from N. by E. to S. E. by E.
2	12,5	From N. N. W. to N. N. E. moderate breeze; dull weather.	
3	14,0	From N.W. to W. faint; weather overcaſt, and fog.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Sept. 4	48 57	49 49	130 59	130 40	22 30 Azim.
5	48 59	48 51	129 00		
	Point arrived at according to the bearing.				
	. . .	48 51	. . .	128 56	
6	. . .	48 59	Longitude of the place whence the bearing was taken.	128 50	22 00 Amp. Eaſtly.
7	At anchor.	48 58	Ditto.	128 54	
8	Point of Departure from the Coaſt of *America*.				22 24 Azim.
	At 6h ½ S.	48 46	At 6h ½ S.	128 48	21 15 Amp. Weſtly.
9	48 01	47 45	129 26	. . .	20 04 Azim.
10	46 33	46 16	130 30	. . .	18 22 Azim.
11	45 10	45 08	131 28	. . .	18 29 plus Azim.
12	44 14	44 00	132 10	. . .	17 20 Azim.
13	43 05	42 56	132 48		
14	40 54	40 38	134 13	. . .	16 14 Azim.
15	38 54	38 45	135 20	. . .	15 37 Azim. 15 27 Amp. Weſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Sept.	Above the freezing point.		
4	14,0	From W. to N. W. freſh breeze; fine weather.	On the 4th, at 4^h P. M. perceived the coaſt of *America* from N. N. E. to N. E. by E.
5	14,5	From N. W. to S. S. W. var. faint; followed by calm, and thick fog.	On the 4th, at 4^h 25′ P. M. Long. by 2 ſets ☉ — ☾. *M.* and *Ch.* 129 ° 58′ 30″ W.
6	14,0	From S. to E. S. E. faint, followed by calm; fine weather, dew in the night.	On the 5th, at noon, the North point of *Berkley* Sound bore E. by N.; *Nootka* Sound N.
7	13,0	From S. E. to N. W. round by the S. faint and calm; weather overcaſt.	On the 6th, at noon, *Berkley* Sound bore E. by S. 4 or 5 leagues; at 5 P.M. anchored in 50 fathoms, over a bottom of black and oozy ſand, at 2½ or 3 leagues from the coaſt; the N. point of *Berkley* Sound bearing E. by S.
8	14,0	W. N. W. light breeze; fog, followed by fine weather.	
9	16,0	From E. N. E. to N. light breeze and fine weather.	On the 7th, at ½ paſt 1 P. M. got under way in order to increaſe our diſtance from the coaſt.
10	15,0	From N. N. E. to S. E. by S. pleaſant breeze; foggy weather.	On the 8th, at ½ paſt 6 P. M. the entrance of *Berkley* Sound bore N. E. ½ E. 6 leagues, whence we took our departure.
11	13,0	From S. W. to W.N.W. pleaſant breeze; fine weather.	
12	18,0	From W. N. W. to W. S. W. faint and calm; cloudy weather.	On the 12th, ſaw ſome *Sea-larks* and a ſmall land-bird.
13	16,0	From W. N. W. to N.W. pleaſant breeze; fine weather.	
14	15,5	N. W. freſh breeze; dull weather.	
15	17,0	From W.N.W. to W. by S. moderate; fine weather, then overcaſt.	On the 15th, was taken on board a ſmall land-bird.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Sept. 16	37 06	36 58	136 07	. . .	14 43 Azim.
17	35 19	35 03	137 39		
18	32 58	32 43	139 27		
19	31 02	30 58	140 51	139 03	11 58 Azim.
20	29 57	29 50	141 53	. . .	10 56 Azim. 10 30 Amp. Eaſtly.
21	29 47	29 46	143 08	141 33	10 12 Azim.
22	29 32	29 34	144 04	. . .	11 00 Amp. Eaſtly. 11 14 Azim.
23	28 32	28 30	145 16	143 47	10 15 Amp. Weſtly.
24	27 35	27 36	146 19	. . .	10 46 Azim. 9 30 Amp. Weſtly.
25	26 35	26 30	146 51	. . .	10 00 Amp. Eaſtly, and Weſtly.
26	26 02	26 07	147 14	. . .	9 32 Amp. Eaſtly. 9 13 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Sept.	Above the freezing point.		
16	16,5	From W by N. to N. N. W. pleasant breeze; cloudy weather.	
17	18,0	From N. N. E. to N. E. fresh breeze; weather overcast and foggy.	
18	17,5	From N. N. E. to N. E. strong breeze, followed by squalls; weather overcast.	On the 18th, saw for the first time *Flying-fishes*, and a small land-bird of the species of the *Canary*.
19	20,0	From N. E. to S. E. light breeze; clear weather.	On the 19th, in the morning, and reduced to noon, Long. by 2 sets ☽ — ☉ *M.* and *Ch.* 0 ′ ″ 139 03 00W.
20	20,0	From S. E. to S. by E. pleasant breeze, with squalls; cloudy weather.	On the 20th and 21st, saw *Tropic-birds* and *Quebrantahuessos*.
21	21,0	From S. S. W. to S. S. E. faint; same weather.	On the 21st, at 8h 00′ A. M. Long. by 4 sets ☽ — ☉ *M.* and *Ch.* 0 ′ ″ 141 24 30W.
22	21,5	From S. S. E. to S. E. by E. moderate breeze; weather overcast; followed by fine weather.	
23	21,5	From S. E. to S. S. E. pleasant breeze; clear weather.	On the 23d, at 9h 37′ A. M. Long. by 2 sets ☽ — ☉ *M.* and *Ch.* 143 38 00W.
24	20,0	From S. E. by E. to E. faint breeze; weather overcast.	Since the 22d, we daily saw *Flying-fishes*, *Tropic-birds*, *Sea-larks*, and, from time to time, *Tunnies* and *Dolphins*.
25	21,0	From E. S. E. to S. E. by E. light breeze, followed by calm; fine weather.	
26	23,0	From S. E. by E. to S. S. E. faint and calm; clear weather.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Sept. 27	25 53	25 56	147 29	. . .	9 54 Azim.
28	24 20	24 16	148 09	. . .	9 34 Azim.
29	22 38	22 37	149 44	. . .	8 49 Azim.
30	21 02	21 02	151 16	149 27	2 85 Azim.
October 1	19 46	19 41	152 49	150 59	8 04 Azim.
2	19 15	19 15	154 39	. . .	8 30 Azim.
3	19 17	19 14	156 49	156 54	
4	19 09	19 13	158 26	. . .	8 00 Azim.
	Point whence the bearing was taken off the Iſland of *O-Whybee*.				
	. . .	19 13	. . .	156 54	
5	18 57	18 54	Longitude of the place whence the bearing was taken.	158 13	
6	. . .	19 00	Ditto.		
7	. . .	19 05	Ditto.		
	At 6 P. M. point of departure in ſight of *O-Whybee*.				
	. . .	19 04	. . .	158 29	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Sept.	Above the freezing point.		
27	22,5	From E. by S. faint to E. N. E. moderate; fine weather.	On the 30th, at 4^h 01′ P. M. Long. by 4 sets ☉—☾ { *M.* . 149 47 30; *Ch.* . 149 41 30; Mean 149 44 30W.
28	21,5	Eaſt, pleaſant breeze; fine weather.	On the 1ſt of October, at 3^h 28′ 30″ P.M. Long. by 4 sets ☉—☾ { *M.* . 151 18 52; *Ch.* . 151 13 08; Mean 151 16 00W.
29	23,0	Eaſt, freſh breeze; fine weather.	On the 2d, ſaw ſome ſea-weed.
30	22,5	From E. to N. E. pleaſant breeze; fine weather.	On the 3rd, at 2^h 15′ P. M. Long. by 2 sets ☉—☾ { *M.* and *Ch.* } 155 17 30W.
Oct. 1	24,0	N. E. by E. pleaſant breeze; fine weather.	Saw a great many *Tunnies* and *Bonitoes*, ſome ſea-weed, and a few *Tropic-birds*.
2	24,0	From N. to E. pleaſant breeze; dull weather.	On the 4th, at 10 A. M. ſaw the Iſland of *O-Whybee*, bearing W. N. W. 3° W.; at noon, it extended from W. 2° 30′ N. to N. W. 7° W. diſtant 8 or 10 leagues.
3	24,0	From E. to E. S. E. moderate, followed by ſqualls; cloudy weather.	On the 5th, at noon, the ſouth point of the Iſland of *O-Whybee* bore E. by N. 5° E.; and the weſtern extremity in ſight, N. W. 8° N.
4	24,0	From E. to E. N. E. moderate breeze; fine weather.	On the 6th, at noon, the Iſland of *O-Whybee* extended from N. by W. 2° 30′ N. to E. S. E. 2° 30′ S.; diſtance off ſhore, 1 ½ leagues.
5	24,0	From N. E. to E. N. E. freſh breeze; fine weather.	The ſame day, at 6^h P. M. the iſland bore from N. 5° E. to E. S. E. 2° 30′ E. diſtance 2 leagues from the neareſt ſhore.
6	24,0	From N. E. to E. S. E. freſh breeze; intervals of calm; fine weather.	On the 7th, at noon, the Iſland of *O-Whybee* bore from N. 8° W. to E.S.E. 3° 30′ E: diſtance 2 ½ leagues from the ſhore.
7	24,0	From E. S. E. to E. light breeze; intervals of calm; fine weather.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Oct. 8	19 29	19 19	159 42	. . .	8 05 Azim.
9	19 35	19 45	160 18	. . .	8 50 Azim.
10	19 57	20 26	160 47	. . .	9 00 Azim.
11	20 09	20 10	162 00	. . .	8 38 Azim. 8 03 Amp. Weſtly.
12	19 08	18 53	163 06	. . .	8 21 Azim.
13	17 26	17 22	165 10	. . .	8 41 Azim. 8 24 Amp. Weſtly.
14	15 52	15 48	167 21	. . .	8 56 Azim.
15	14 47	14 45	169 38	. . .	9 24 Azim. 9 52 Amp. Weſtly.
16	14 19	14 16	171 33	. . .	10 14 Azim. 10 59 Amp. Weſtly.
17	13 50	13 39	173 37	. . .	10 26 Azim.
18	13 37	13 34	175 48		
19	13 33	. . .	177 23	178 48	10 56 Azim.
20	13 32	13 32	178 48	EAST. 179 41	10 58 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Oct.	Above the freezing point.		
8	24,0	From W.S.W. to E.S.E. round by the S. var. faint; clear weather.	On the 8th, at ½ past 8, A. M. saw the Island of *Mowee*, bearing N. N. E. 8° E.
9	25,0	Calm, then from S. to S. E. faint; cloudy weather.	On the 9th, at ½ past 5 P. M. still perceived the summit of *O-Whybee* bearing E. 2° 30′ N. distant 46 leagues.
10	25,0	From E. to N. E. faint; intervals of calm; clear weather.	On the 10th, at noon, the Island of *Atowi* shewed itself to the N. N. W. 3° N. at the distance of 34 leagues.
11	26,0	From N. E. to E. moderate breeze; fine weather.	From the time of our leaving the *Sandwich* Islands, we constantly saw *Boobies*, *Man-of-war-birds*, *Tropic-birds*, *Terns*, *Flying-fishes*, and now and then *Tunnies* and *Bonitoes*.
12	25,5	From N. E. to E. pleasant breeze; fine weather.	
13	26,0	E. N. E. fresh breeze; clear weather.	
14	25,5	Ditto; ditto.	
15	25,0	Ditto moderate; fine weather.	
16	26,5	From E. N. E. to E. by N.; pleasant breeze; cloudy weather.	
17	26,0	From E. by N. to E.N.E. fresh breeze, followed by squalls; cloudy weather.	
18	25,0	From E. N. E. to E.; moderate weather, followed by slight squalls; cloudy weather.	On the 19th, at 9^h 42′ A. M. Long. by 2 sets ☽ — ☉ } *M.* and *Cb.* } ° ′ ″ 178 39 00 W.
19	23,5	East, squally with rain; weather overcast.	On the 20th,
20	26,2	From E. to E. N. E. moderate; clear weather.	at 8^h 26′ 39″ A. M. Long. by 2 sets ☽ — ☉ } *M.* and *Cb.* } 179 54 00 E.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Oct. 21	13 34	13 32	179 23	. . .	12 02 Azim. 11 08 Amp. Weſtly.
22	13 34	13 36	177 17	. . .	12 07 Azim. 12 33 Amp. Eaſtly.
23	13 40	13 40	175 18	172 33	12 49 Azim.
24	13 43	13 44	173 09	. . .	11 46 Azim.
25	13 48	13 45	170 33	. . .	13 05 Azim.
26	13 49	13 45	167 56	. . .	12 27 Azim.
27	13 48	13 51	165 08		
28	13 36	13 42	163 08	. . .	11 05 Azim. 10 39 Amp. Weſtly.
29	13 43	. . .	160 46	. . .	10 10 Azim.
30	13 24	13 24	158 36	. . .	9 40 by 8 Azim.
31	13 29	. . .	156 29	. . .	8 04 Azim.
Nov. 1	13 44	13 42	154 42	. . .	8 08 by 5 Azim.
2	14 24	14 26	152 38	145 14	7 27 Azim.
3	14 59	15 06	150 31		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Oct.	Above the freezing point.		
21	25,5	E. by N. pleasant breeze; fine weather.	On the 21st, saw a small land-bird, resembling a *Plover*, and a great number of oceanic birds.
22	25,5	Ditto, ditto.	
23	26,0	From E. by N. to E. N. E. pleasant breeze; cloudy weather.	On the 23th, at 8h 43′ A. M. Long. by 4 sets ☽ — ☉ } *M.* and *Ch.* } 172° 51′ 30″ E.
24	25,5	E. N. E. fresh; squalls at intervals; fine weather.	On the 24th, saw a land-bird, and various oceanic birds, such as *Boobies*, *Man-of-war-birds*, *Tropic-birds*, *Mews*, &c.
25	25,0	E. N. E. fresh by squalls, with rain; cloudy weather.	
26	25,5	From E. by N. to E. N. E. fresh breeze; fine weather.	From time to time saw birds of the same species.
27	25,0	From E. N. E. to E. by S. moderate breeze; fine weather.	
28	26,0	From E. to E. N. E. moderate breeze; fine weather.	
29	25,0	From E. by N. to E. N. E. fresh breeze, followed by squalls and rain.	
30	26,7	From E. S. E. to E. N. E. moderate; followed by squalls and rain.	
31	25,0	Ditto; ditto.	
Nov. 1	24,0	Ditto; rainy weather.	
2	25,5	From E. to S. S. W. variable in squalls; weather overcast and rainy.	On the 2d, saw a small *white Mew*. On the 2d, at 2h 27′ P. M. Long. by 4 sets ☉ — ☾ } *M.* and *Ch.* } 148° 02′ 00″ E.
3	24,0	S. S. E. stiff breeze, accompanied by squalls; rainy weather.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Nov. 4	14 53	14 50	148 15	144 34 or 144 13 by a mean corrected, between the obſervations of the 2d and thoſe of the 4th.	6 12 Azim.
5	15 13	15 30	147 29	. . .	5 50 Azim.
6	15 58	16 02	146 29	. . .	5 16 Azim.
7	16 07	16 12	146 03	. . .	4 52 Azim.
8	16 47	17 03	144 17	. . .	4 36 Azim.
9	18 09	18 00	141 59		
10	18 53	18 48	140 00	. . .	2 58 Azim.
11	19 34	19 41	138 08	. . .	2 32 Azim.
12	20 24	20 26	136 27	. . .	2 12 Azim.
13	21 05	21 05	134 57	. . .	2 17 Azim.
14	21 27	21 19	132 57	. . .	1 29 Azim.
15	21 38	21 46	131 16		
16	21 50	21 34	128 21	122 06	0 00 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Nov.	Above the freezing point.		
4	25,0	S.S.E. freſh; ſqualls and rain at intervals.	On the 4th, at 5^h 01′ P. M. Long. by 2 ſets ☉ — ☾. *M.* and *Cb.* 144 05 00 E.
5	26,0	From S. S. E. to S. by W. moderate breeze; fine weather.	
6	26,0	Variable, faint, calm at intervals; fine weather.	On the 4th, at 3 P. M. perceived the Iſland of *Tinian* bearing W. by N. and the Iſland of *Saypan* N. N. W. ½ W. At ¾ paſt 5, *Tinian* bore from W. S. W. ½ W. to N. W. ½ W. 2 leagues; the Peak of *Saypan* N. by W.; the Iſland of *Aiguigan* S. W. by W.
7	26,0	From E. N. E. to E. light breeze; fine weather.	
8	25,0	N. E. Freſh breeze, and a few ſqualls; fine weather.	On the 5th, the northern extremity of the Iſland of *Saypan* bore S. E. by S. 4 leagues, and its weſtern extremity S. by E.
9	25,0	From N. E. to E. S. E. moderate; weather overcaſt.	
10	25,0	From E. N. E. to N. N. E. moderate breeze; fine weather.	On the 8th, 9th, 10th, and 11th, ſaw a great many oceanic birds of various ſpecies, moſtly the ſame as before; among others a number of *Tropic birds*
11	24,0	From N. E. by E. to E. moderate; cloudy weather.	
12	25,0	From E. to E. S. E. pleaſant breeze; fine weather.	
13	24,0	E. S. E. moderate; clear weather, followed by ſqualls and rain.	
14	24,0	N. E. moderate breeze; fine weather.	
15	22,0	Var. faint; boiſterous weather, followed by ſqualls.	
16	22,0	From N. N. E. to N. E. freſh breeze; fine weather.	On the 16th, at 9^h 29′ A. M. Long. by 2 ſets ☾ — ☉. *M.* and *Cb.* 122 25 00 E.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Nov. 17	21 48	21 58	126 16	. . .	0 12 Azim.
18	21 41	. . .	124 47		
	Point whence the bearing was taken off the Iſland of *Formoſa*.				
	. . .	21 48	. . .	118 28	
19	22 17	. . .	116 47		
20	22 34	. . .	114 35		
21	22 24	. . .	113 33		
	Point whence the bearing was taken off *Pedra Branca*.				
	. . .	22 24	. . .	113 00	
22	*Ling-Ting* Iſland bearing half a mile North.				
23	At anchor under *Chi-Chow* Iſland.				
24	. . .	22 03½			

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Nov.	Above the freezing point.		
17	24,0	From N. E. to E. N. E. moderate; fine weather.	On the 17th, at 7 A. M. perceived the Iſlands of *Botel-Tabago-Xima* bearing W.; at noon, the great *Botel* Iſland bore from W. by N. 1° W. to N.N.W. 1° W. about 7 leagues; the ſmall iſland of that name bore W. 3° S. and the middle of the channel which ſeparates them W. 6° N
18	23,5	From N. E. by E. to E. freſh breeze; fine weather.	The ſame day, at 5 P. M. ſaw the Iſland of *Formoſa* bearing W. by N.
19	22,0	From S.S.E. to N. round by the E. accompanied by ſqualls; weather overcaſt and rainy.	On the 18th, at noon, the ſouth point of *Formoſa* bore E. N. E. ½ N. diſtant about 4½ leagues.
20	19,0	N. E. freſh, followed by ſqualls; gloomy weather.	On the 20th, at ½ paſt 6 A. M. perceived the coaſt of *China* to the N. W: ſince midnight, the ſoundings are 22, 25, and 30 fathoms, over a bottom of gray ſand; ſeveral Chineſe fiſhing-veſſels in ſight.
21	19,0	From E. N. E. to N. freſh breeze, accompanied by ſqualls and rain; foggy weather.	On the 21ſt, at ½ paſt 7 A. M. perceived *Pedra Branca* to the W. by S. 3° S.; the lead indicated from 35 to 30 fathoms, gray ſand, and there were ſtill a number of fiſhing-boats in ſight. At ½ paſt 9, *Pedra Branca* bearing N. 2 miles, hove to
22	11,0	From N. N. E. to N. N. W. freſh breeze, accompanied by ſqualls; weather overcaſt.	till noon, waiting for a pilot. In the evening of the ſame day, came to an anchor in 18 fathoms over a bottom of ſoft mud, the *Grand Lema* bearing S.W. and the entrance of the *Deep Bay* N. W. by N. diſtant 2 leagues.
23	10,0	From N.N.W. to N.N.E. ſtrong breeze, accompanied by ſqualls; weather overcaſt.	On the 22d, in the morning, got under way: at noon, ranged along the Iſland of *Ling-Ting* at a little diſtance to the ſouth; at ¾ paſt noon, anchored in 13 fathoms, muddy bottom, the Peak of
24	11,0	From N. to N. E. moderate; fine weather.	*Chi-Chow* bearing N. N. E. ¼ E. 1 mile from the land.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs.
1791.	° ′	° ′	° ′	° ′	° ′
Nov. 25	. . .	22 11			
26-27					
28					
29					
30					
Dec. 1	At anchor in *Macao* Road, near the *Typa*,				
2					
3					
4					
5					
6					
	Point of Departure at $0^h \frac{3}{4}$ after midnight.				
7	. . .	21 55	. . .	111 22	
	20 47	20 94	111 35		
8	18 12	17 54	112 04		
9	15 21	15 18	111 26		
10	13 22	13 22	109 25		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Nov.	Above the freezing point.		
25	11,0	From N. N. E. to N. pleasant breeze; fine weather.	On the 25th, at 6 A. M. got under way; and the same day, at ½ past 11 A. M. came to in the road of *Macao* in 5 ½ fathoms, over a bottom of soft mud, the town of *Macao* bearing N. W. ½ W. 2 leagues; Point *Peac* of *Montanha* Island N. N. E. ½ E.; and the Peak of *Lan-Tao* E. N. E. ½ N.
26-27	11,0	From N. to N. N. E. fresh breeze; fine weather.	
28	11,0	From N. to N. N. E. strong gale and violent squalls; gloomy weather.	On the 26th, as we had lost by sailing round the world by the west, we added one to the computation of time on board the ship, and we reckoned the 27th of November in lieu of the 26th.
29	12,0	Ditto; ditto.	
30	13,0	N. N. E. moderate; fine weather.	
Dec.			
1	14,5	Ditto; ditto.	
2	15,0	North, moderate; fine weather.	
3	13,5	Ditto, fresh; clear weather.	On the 3rd, at 3h P. M. we weighed anchor, and at ½ past 5 brought up near the *Typa*, the town of *Macao* bearing W. N. W. ½ N.; the Peak of *Montanha* S. W. ½ W.
4	15,0	From N. to N.N.E. fresh breeze; weather overcast.	
5	16,5	Ditto, moderate; cloudy weather.	
6	16,0	Ditto, fresh; clear weather.	On the 6th, at 6 P. M. got under way from the road of *Macao*.
7	21,0	From N. by E. to N. E. by E. accompanied by squalls; weather overcast.	On the 7th, at ¼ past midnight, the South extremity of the *Grand Lema* bore E. 1 ½ or 2 leagues, whence we took our departure.
8	23,0	N. E. strong breeze; clear weather.	On the 9th, at ½ past 5 A. M. being on the *Macclesfield* bank, sounded in 65 fathoms, bottom of small broken shells, mixed with fine black and white gravel.
9	23,0	Ditto; ditto.	
10	24,0	From N. E. to N. N. E. fresh breeze; clear weather.	On the 10th, saw a *Sea-snake* on the water.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs.
1791.	° ′	° ′	° ′	° ′	° ′
Dec. 11	11 18	11 14	107 20		
12	9 38	. . .	106 17		
	Point of departure deduced from the bearing taken off *Pulo-Sapeta*.				
	. . .	9 12	. . .	106 16	
13	7 36	6 53	104 40		
14	4 52	4 40	103 35		
15	3 23	. . .	103 12		
	Point of departure deduced from the bearing taken off *Pulo-Aor*.				
	. . .	3 02	. . .	102 19	
16	1 46	. . .	103 05		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
11	22,0	From N. N. E. to N. E. freſh breeze; weather overcaſt.	On the 11th, ſaw a number of *Boobies*; at ½ paſt 4 P. M. perceived the *Three Brothers* bearing W. by S. about 5 leagues: at midnight following, ſaw *Pulo-Sapata*, to the S. W. by W; and three quarters of an hour after, it bore directly W. 4 or 5 miles, whence we took our departure.
12	22,0	From N. N. E. freſh to E. moderate; weather overcaſt.	
13	23,5	From E. to N. E. freſh in ſqualls; weather overcaſt.	On the 13th, ſaw ſome *Sea-ſwallows* and *Boobies*: at ¾ paſt 11 P. M. ſounded in 49 fathoms, bottom ſoft mud.
14	24,5	From S. E. by E. to N. E. moderate, in ſqualls; weather overcaſt.	On the 14th, the lead ſucceſſively indicated 40, 50, and 45 fathoms, bottom of mud and oozy ſand.
15	21,0	Var. from E. N. E. to N. W. round by the S. ſqualls with rain.	On the 15th, at 6 A. M. perceived *Pulo-Timoan* to the S. S. W. ſoundings from 36 to 38 fathoms, bottom of hard mud: at 8 A. M. the S. E. extremity of *Pulo-Piſſang* S. ½ W.: at ¾ paſt 2 P. M. *Pulo-Aor* bore S. S. W. 4 or 5 leagues, whence we took our departure.
16	22,0	From N. N. W. to N. by E. moderate; weather overcaſt and rainy.	On the 16th, ſaw ſome *Sea-ſnakes* on the water.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs.
1791.	° ′	° ′	° ′	° ′	° ′
Dec. 17	0 04	. . .	103 12		
	SOUTH.	SOUTH.			
18	0 20	1 15	102 57		
	Longitude, after taking the bearing, 6 leagues to the North of *Banca*. . .			103 18	
19	At anchor on the North Coaſt of *Banca* Iſland.				
	1 23	. . .	107 07		
20	At anchor on the coaſt of *Banca* Iſland.				
	1 16	. . .	103 16		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Decem.	Above the freezing point.		
17	23,0	Variable, ſqualls and rain; weather overcaſt.	On the 17th, at ¼ paſt 9 A. M. ſaw an *Iſland* to the S. S. W.; at ¾ paſt 10 ſounded in 20 fath. bottom of ſand and mud; ſaw ſome *Sea-ſnakes*, and pieces of wood drifting before the ſea. At ¾ paſt 5 P. M. perceived the coaſt of the Iſland of *Banca* from S. to S. S. W.: anchored immediately in 19 fathoms, over a bottom of ſand and mud, the north point, or Point *Peſant* of *Banca* Iſland bearing S. a few degrees E.; the W. extremity in ſight of the coaſt of the ſame iſland S. S. W.
18	24,0	From N. W. to N. W. by N. moderate; fine weather.	On the 18th, at ½ paſt 7 A. M. weighed anchor. At noon, the N. coaſt of *Banca* extended from S. E. ½ S. to S. W. ½ S. diſtance 6 leagues: ſounded in 19 and 18 fathoms, bottom of ſand and mud. At ½ paſt 3 P. M. anchored in 16 fathoms, bottom of ſand, gravel, and ſhells, the coaſt of *Banca* Iſland bearing from E. by S. to S. W. by W. diſtance off ſhore 3 leagues. The currents ſet to the E. S. E. the whole night, and in the morning of the 19th to the S. S. W.
19	24,5	From N. to N. W. freſh; fine weather.	On the 19th, at ½ paſt 1, got under way. At 6 P. M. anchored in 18 fathoms, fine gray ſand, mixed with broken ſhells; *Banca* Iſland bearing from S. S. E. to S. W.; the currents ſet to the E. S. E. while we remained at anchor till the morning of the 21ſt.
20	24,0	From N. W. to N. N. W. freſh, accompanied by ſqualls; cloudy weather.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs.
1791.	° ′	° ′	° ′	° ′	° ′
	1 29	1 30	103 32	. . .	
Dec. 21	Long. from whence the bearing was taken off the North Point of *Banca*.			103 42	0 00 Amp. Weſtly.
22	2 10	2 21	104 12		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
21	25,0	From N. W. by N. to N. pleafant breeze; fine weather.	On the 21ft, at ½ paft 7 A. M. got under way. At noon, point *Pefant* of *Banca* Ifland bore from W. ½ S. to S. W. by W. 4° W. the part of its coaft in fight to the eaftward, S. E. by S.; the foundings were 19 fathoms, with a rocky and gravelly bottom. At ¾ paft 6 P. M. anchored in 14 fathoms, over a bottom of fand, gravel and broken fhells. Point *Brifée* of the Ifland of *Banca* bearing W. S. W. 5° W. The currents fet to the S. E. and E. S. E. but with no great ftrength.
22	25,0	From N. W. to N.N.W. moderate; fine weather.	On the 22d, at 50 min. paft 7 A. M. got under way. At noon, the extremities of a *lofty mountain* on the Ifland of *Banca* bore from S.S.W. to S. W. 4° W the Eaft point of *Banca* S. E. 2° S. *Gafpar* Ifland Eaft. The depth of water was 14 fathoms, over a bottom of fand and gravel, mixed with broken fhells. At 40 min. paft 6, anchored in *Gafpar*'s Strait in 17 fath. bottom fand and gravel; a hummock on the *Eaft* point of *Banca* bearing N. N. W. ½ N. *Gafpar* Ifland N. by E. 2° E. the Peninfula of *Sel* from S. S. W. to W. 1° S The currents fet to the S. E. and to S 1 ½ miles per hour

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs.
1791.	° ′	° ′	° ′	° ′	° ′
Dec. 23	3 05	3 30	104 28		
24	3 50	3 51	104 06		
25	4 08	4 25	103 46		
26	4 59	5 04	103 36		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
23	24,5	From W. to N. W. moderate; fine weather.	On the 23d, at ¾ paſt 6, A. M. got under way; at ¾ paſt 9, we were clear of *Gaſpar* Strait. At noon, the S. E. part of *Banca* Iſland bore from N. W. ½ W. to N. N. W. ½ N.; the lead indicated from 10 to 11 fathoms, with a bottom of ſand and gravel. At ½ paſt 9, P. M. anchored in 12 ½ fathoms, bottom ſand and mud, out of ſight of land. The currents ſet S. E. by S. then to S. S. W. faint.
24	24,0	Variable in ſqualls; weather overcaſt.	On the 24th, at 11 A. M. got under way, and at 5 P. M. anchored in 10 fathoms, oozy ſand. The currents ſet E. S. E. then N. W. very faint.
25	24,0	From W. N. W. to N. N. W. moderate; fine weather.	On the 25th, at 8 A. M. got under way. At ½ paſt noon, perceived the coaſt of *Sumatra*, W. 6 or 7 leagues. At 8 P. M. anchored in 12 ½ fathoms, over a bottom of ſand and ſhells. The currents ſet E. ſometimes inclined to the South, at others to the North.
26	25,0	From N. W. to S. faint, ſqually; weather overcaſt.	On the 26th, at ½ paſt 6 A. M. got under way. At 7 perceived the *Two Brothers* bearing S. W.; at noon, they bore from S. W. to S. W. ½ W. diſtant one league. At ½ paſt 4, P. M. anchored in 10 fathoms, ſand, mud, and ſhells, the *Two Brothers* bearing from N. E. by N. to N. N. E. ½ N. 1 ½ leagues. The currents ſet S. S. W. till midnight, then N. E.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs.
1791.	° ′	° ′	° ′	° ′	° ′
Dec. 27	5 17	5 22	103 26		
28	5 32	5 34	103 19		
29	5 37	. . .	103 18		
30	At anchor near *North* Iſland. 5 42	5 45	103 16		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
27	25,5	From W. S. W. to E. round by the N. light breeze, followed by calm; gloomy weather.	On the 27th, at ½ paſt 6 A. M. got under way. At noon, the South point of the *Two Brothers* bore N. N. E.; and a large mountain on the Iſland of *Sumatra* S. W. At 4 P. M. anchored in 17 fathoms, muddy bottom, *North* Iſland bearing S. W. ½ S.; Cape *St. Nicholas* of the Iſland of *Java* from S. S. E. to S. by E. The current ſet to the South at the rate of half a league per hour, till 8 P. M.; then N. E.
28	25,5	From W.S.W. to S.S.W. freſh; fine weather.	On the 28th, at ¾ paſt 6, got under way. At noon, Cape *St. Nicholas* of the Iſland of *Java* bore S. S. E. 3° E. *North* Iſland S. W. by S. At ½ paſt 4, anchored in 20 fathoms, bottom ſand and gravel. *North* Iſland bearing W. S. W. ½ W. 1 league; *Grande Toque* South. The currents ſet rapidly to the S. W. till ½ paſt 6 P. M. then N. E. till the next day.
29	25,5	From S.S.W. to W.S.W. freſh breeze; fine weather.	On the 29th, it was ſlack water at 10 A. M. got under way at noon. At 7 P.M. anchored in 22 fathoms, bottom ſand and mud, *North* Iſland bearing N. W. by W. ¾ of a league. *Middle* Iſland S. by W. 2° W. The currents ſet N. E. 1 mile an hour till the next day.
30	25,0	From S. W. to S. S. W. freſh breeze; fine weather.	On the 30th, remained at anchor; the tide or current was ſlack the whole morning; after noon, the current ſet S. W. till 7 P.M. then N. E. till the next morning.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſery. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. EAST.
1791.	° ′	° ′	° ′	° ′	° ′
Dec. 31	5 48	. . .	103 15	. . .	0 49 Amp. Eaſtly.
1792.					
Jan. 1	5 51	5 53	103 01	. . .	
2	6 03	6 03	102 56	. . .	1 22 Amp. Weſtly.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Dec.	Above the freezing point.		
31	25,5	From S. W. to S. S. W. freſh breeze; fine weather.	On the 31ſt, at ¾ paſt 7 A. M. got under way. At noon, *Middle* Iſland bore S. S. W. ½ W.; *North* Iſland N. N. W. ½ W. At ¼ paſt 6 P. M. anchored near *Remow* Iſland in 30 fathoms; bottom of gravel and broken ſhells; *Middle* Iſland bearing from S. E. to S. S. E. 4° S. the Peak of *Cracatoa* S.W. ½ W. At 8 P.M. the currents which had ſet to the S. W. changed their direction, and ſet N. E. the whole night.
Jan.			
1	24,5	From S.S.W. to W.S.W. light breeze; fine weather.	On the 1ſt, at 6 A. M. the currents took a direction to the S. W. At ½ paſt 7 got under way. At noon, the Peak of *Sambouricou* bore W. by S.; the Peak of *Cracatoa* S. W. ½ W.; *Middle* Iſland E. ½ S. At ¾ paſt 6, anchored in 30 fath. bottom oozy ſand and broken ſhells; the Iſland of *Cracatoa* and the adjacent iſlands bearing from S. W. to W. S. W.; the centre of *Sabeſſe* Iſland N. W. The currents ſet N. E. till ½ paſt 7 A. M. the next day.
2	25,0	From S.S.W. to W. by S. faint; fine weather.	On the 2d, at ½ paſt 7 A. M. got under way with the current at S. W. At noon, *Middle* Iſland bore E.N.E. ½ E. the Peak of *Sambouricou* Iſland bore N. W. ¼ W. At ¼ paſt 6, P. M. anchored in 22 ½ fathoms, muddy bottom; *Sambouricou* Iſland bearing from N. W. ½ N. to N.; *Cracatoa* Iſland and the adjacent iſlands from S. by W. ¼ W. From that moment, the currents ſet N. and ſhortly after N. E. till next day.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. EAST.
1792.	° ′	° ′	° ′	° ′	° ′
Jan. 3	5 58	. . .	102 52	. . .	0 22 Amp. Eaſtly.
4	6 04	. . .	102 45		
	Point of Departure according to the bearing taken at noon.				
	. . .	6 04	. . .	102 55	
5	6 30	6 39	102 10		
6	7 37	7 57	101 24		
7	8 58	8 54	100 21	. . .	WEST. 0 29 Amp. Weſtly.
8	9 39	9 35	98 53	. . .	EAST. 0 19 Azim.
9	10 07	10 22	97 47	. . .	0 48 Azim.
10	10 49	10 53	96 42	. . .	1 00 Azim.
11	11 20	11 28	95 24	. . .	1 03 Amp. Weſtly.
12	11 57	11 53	94 32	. . .	WEST. 0 40 Azim.
13	12 15	12 20	93 14	. . .	0 49 Amp. Eaſtly.
14	13 30	13 30	91 08	. . .	0 51 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Jan.	Above the freezing point.		
3	25,5	From S. W. to W. faint; fine weather.	On the 3rd, at 6 A. M. the tide changed and set S. W.; got under way immediately. At noon, the Island of *Sambouricou* bore N. E. by N. 1 mile. At ½ past 6 P. M. anchored in 39 fath. bottom soft mud. The centre of *Sambouricou* bearing E. N. E. 2° N. the Peak of *Cracatoa* S. E. by S. The currents continued to run to the W. S. W. till 8 P. M.; they then set W. N. W. till midnight.
4	25,5	Var. faint; rain, followed by fine weather.	
5	26,0	From W. N. W. fresh in squalls, to S. E. faint; fine weather.	
6	26,5	From E. S. E. to S. S. E. pleasant breeze; fine weather.	On the 4th, since midnight, the currents set W. S. W. and S. W. At 10 A. M. got under way. At noon, the Island of *Cracatoa* and the adjacent islands bore from E. to E. S. E. 8° S. *Prince's* Island, South, whence we took our departure.
7	26,2	S. E. by S. pleasant breeze; fine weather.	
8	25,5	From S. S. E. to S. by E. moderate; fine weather.	On the 5th, we were clear of the Strait of *Sunda*, and out of sight of land.
9	27,5	From S. E. by S. to S. faint; fine weather.	On the 6th and 7th, saw a number of *Boobies* and *Tropic Birds*.
10	25,5	From S. by E. to S. E. by S. moderate; fine weather.	On the 10th, 11th, and 12th, saw a great many *Boobies*, *Man-of-war-birds*, and *Tropic-birds*, as well as a quantity of *Tunnies* and *Bonitoes*.
11	25,5	From S. by E. to S. E. light breeze; fine weather.	On the 11th, at ½ past 4 P. M. we perceived to the S. S. E. at 6 leagues' distance, a low island, which we judged to be the most northern of the Islands of *Cocos*.
12	25,5	From S.S.E. to S. by W. moderate; fine weather.	On the 13th P. M. spoke a Dutch East-Indiaman bound to *Batavia*.
13	25,5	From S. S. E. to E. S. E. pleasant breeze; fine weather.	On the 13th and 14th, saw the same birds in a smaller number.
14	26,5	From S. E. by S. to S.S.E. fresh breeze; clear weather.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
Jan. 15	14 42	14 42	88 52	. . .	1 02 Azim.
16	15 42	15 53	86 30	85 00	1 14 Azim.
17	16 53	16 52	84 09	. . .	1 46 Amp. Eaſtly.
18	17 48	. . .	81 67	. . .	2 02 Azim.
19	18 40	18 50	79 21	77 33	2 34 Azim.
20	19 26	19 38	77 07	. . .	4 56 Amp. Weſtly.
21	19 59	20 10	75 16	. . .	6 12 Azim.
22	20 00	20 03	73 09	. . .	6 28 Amp. Weſtly.
23	19 48	19 48	71 13	. . .	7 11 Amp. Weſtly.
24	19 51	19 46	69 53	. . .	8 07 Azim.
25	19 45	19 52	68 14	. . .	9 00 Azim.
26	19 46	19 46	66 41	. . .	9 53 Amp. Weſtly.
27	19 38	19 37	65 04	62 24	10 18 Amp. Weſtly.
28	20 01	20 04	63 00	. . .	12 28 Azim.
	Longitude deduced from the bearing taken off *Rodrigue* Iſland in the morning.			59 54	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Jan.	Above the freezing point.		
15	25,5	From S. S. E. to S. E. freſh breeze; fine weather.	
16	26,0	From S. E. to E. S. E. moderate; cloudy weather.	On the 16th, at 8h 53′ 48″ A. M. Long. by 4 ſets ☾ — ☉ } *M.* and *Ch.* } 85° 15′ 00″ E.
17	25,0	S. E. freſh breeze; fine weather.	On the 17th, ſaw a *red-ſhafted Tropic-bird.*
18	25,0	From S. E. by S. to E. S. E. freſh in ſqualls; cloudy weather.	
19	25,0	E. S. E. freſh breeze; fine weather.	On the 19th, at 8h 01′ 47″ A. M. Long. by 4 ſets ☽ — ☉ } *M.* and *Ch.* } 77 59 00 E.
20	24,0	Ditto, moderate; fine weather.	
21	25,0	From E. S. E. to E. by S. moderate; clear weather.	We ſaw conſtantly *red-ſhafted Tropic-birds.*
22	25,0	From E. by S. to E. moderate; clear weather.	
23	24,0	Eaſt, variable, moderate; fine weather.	On the 26th, ſaw ſome ſmall *gray Terns.*
24	25,0	Eaſt, light; clear weather.	On the 27th, at 11h 2′ 15″ A.M. Long. by 4 ſets ☾ — ☉ } *M.* and *Ch.* } 0 ′ ″ 62 29 00 E.
25	25,2	From E.S.E. to E. light; fine weather.	
26	24,6	From E. S. E. to S. E. moderate; fine weather.	Ditto, at 4h 34′ 44″ P.M. Long. by 2 ſets ☉ — ☽ } *M.* and *Ch.* } 62 00 00 E.
27	25,0	From E. S. E. to S. E. pleaſant breeze; fine weather.	The ſame day, at 6 P. M. perceived *Rodrigue* Iſland bearing W. by S. diſtant about 14 leagues.
28	25,5	From E. by S. to E.S.E. moderate; clear weather.	On the 28th, at ¼ paſt 5, A. M. *Rodrigue* Iſland bore N. E. 1° N. which gave for the point of departure 60° 28′ Eaſt longitude.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
Jan. 29	19 57	19 47	57 47		
30	20 09	. . .	55 45		
	Longitude arrived at according to the bearing.			55 25	
31					
Feb. —					
	At anchor off Port *Nord-Oueſt* of the Iſle of *France*.				
March —					
April 18					
Ditto	Point of departure in ſight of the Iſle of *France*.				
	. . .	20 04	. . .	55 04	
19	20 45	20 59	54 00		
	Longitude arrived at in ſight of the Iſle of *Bourbon*.			53 23	
20					
21	At anchor in the Road of *St. Denis* of the Iſle of *Bourbon*.				
Ditto	Point of Departure in ſight of the Iſle of *Bourbon*.				
	. . .	20 48	. . .	53 08	
22	21 31	21 33	52 07		
23	23 00	23 06	51 15	. . .	18 20 Amp. Eaſtly.
24	24 21	24 23	50 13		
25	25 04	25 38	49 20		
26	25 56	25 56	48 49	. . .	23 00 Azim.
27	26 48	26 39	47 26		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Jan.	Above the freezing point.		
29	25,0	From S. E. to E. S. E. pleasant breeze; fine weather.	On the 30th, at ½ past 6 A. M. saw *Round* Island to the W. by N. a few degrees W. At 8 perceived the Isle of *France*. At 11 *Round* Island bore North. At 4 P. M. anchored at the entrance of Port *Nord-Ouest* in the Isle of *France*.
30	25,0	S. E. pleasant breeze; fine weather.	On the 31st of January, A. M. anchored in Port *Nord-Ouest*, where we remained till the 18th of April following.
April			
19	23,0	S. S. E. light breeze; fine weather.	On the 18th of April, P. M. set sail from Port *Nord-Ouest* in the Isle of *France*; and at 6 P. M. set *Gunner's* Point N. E. by N. 2° E. and *Pitrebot* S. E. 7° E. whence we took a point of departure.
20	23,0	From S. E. to S. S. E. moderate; fine weather.	
21	22,0	From S. E. to E. S. E. fresh breeze; fine weather.	On the 19th, at ½ past 6, A. M. perceived the Isle of *Bourbon* (at this day called the Island of Réunion) to the S. W. by W.; at noon, it bore from S. S. W. ½ W. to W. by S. 2° W.
22	22,0	From E. N. E. to S. E. moderate; cloudy weather.	
23	22,0	From S. E. by E. to N. E. moderate; gloomy weather.	On the 20th, at ¼ past 9 A. M. anchored in the road of *St. Denis* in the Isle of *Bourbon*, in 10 fathoms, over a bottom of sand and gravel, mixed with broken shells.
24	21,5	From E. N. E. to N. E. moderate; clear weather, followed by a storm.	On the 21st, at 7 P. M. got under way; and at ½ past 7, *St. Denis* bore S. E. 4° S. the western extremity in sight of the Isle of *Bourbon*, W. S. W. 3° S. whence we took our departure.
25	21,0	From N. E. to S. E. var. faint; gloomy weather accompanied by lightning and rain.	We constantly saw *Tropic-birds* since we left the Isle of *France*.
26	21,0	From S. E. to N. E. var. faint, followed by squalls and rain.	
27	20,0	From E. N. E. to E. fresh with squalls and rain; cloudy weather.	On the 26th and 27th, we still saw *Tropic-birds*, an *Albatross*, and some *Shear-waters*.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
April 28	27 23	27 11	44 51	42 44	23 11 Amp. Eaſtly.
29	27 57	27 50	41 53	39 22	
30	28 31	28 18	39 23		
May 1	29 03	29 00	37 26	. . .	26 17 Azim.
2	29 36	29 25	36 04	. . .	27 13 Azim.
3	29 55	30 28	34 55		
4	31 04	31 08	33 47		
5	31 55	32 11	32 41		
6	31 50	31 53	32 13	. . .	24 34 Azim.
7	32 47	32 51	30 00		
8	32 57	. . .	29 42		
9	32 53	33 33	29 28		
	Point of Departure in ſight of the Coaſt of *Africa*.				
	. . .	33 33	. . .	25 57	
10	33 46	. . .	25 52		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
April	Above the freezing point.		
28	20,5	E. S. E. fresh breeze; fine weather.	On the 28th, at 2h 45′ P. M. by 4 sets ☉ — ☽. Long. *M.* and *Ch.* 0 ′ ″ 42 27 52 E.
29	19,5	From S. E. to E. S. E. fresh breeze; clear weather.	
30	19,5	E. S. E. fresh breeze; weather overcast.	On the 29th, at 3h 16′ P. M. by 3 sets ☉ — ☽. Long. *M.* and *Ch.* 39 02 30 E.
May 1	20,0	From E. S. E. to E. moderate; fine weather.	
2	21,5	Ditto, faint; fine weather.	
3	21,0	From E. N. E. to N. moderate; fine weather.	We constantly saw *Albatrosses*, *brown Petrels*, and *Alcyons*.
4	21,0	Variable, faint; cloudy weather.	
5	17,0	From N. N. E. to S. W. strong gale and squally; cloudy weather.	On the 5th and 6th, saw a greater number of birds of the same species, and a few *spotted Petrels*.
6	20,0	From S. W. to E. by N. faint, followed by a stiff gale; clear weather.	On the 8th, P. M. perceived the coast of *Africa* in the vicinity of Point *Natal*, bearing from N. 2° W. to N. W. by N. 2° W.
7	19,0	From E. by N. to N. W. by N. strong gale, followed by calm, clear weather.	On the 9th, at noon, the coast of *Africa* bore from N. W. by W. 2° W. to N. 2° W. whence we took our departure. The same day, at 2 P. M. sounded in 75 fath. bottom gravel and broken shells; at this moment, the coast of *Africa* bore from W. 4° N. to N. E. by N. 2° N.
8	16,0	From N. W. to W. S. W. strong gale in squalls; clear weather.	
9	18,0	From N. to W. var. fresh breeze; clear weather.	
10	14,0	From N. W. by N. to W. S. W. strong gale and squally, clear weather.	On the 10th, lay to in a boisterous wind and heavy sea. We did not cease to see *Albatrosses*, *Pintadoes*, *Petrels*, and *Alcyons*.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
May 11	33 31	34 42	26 20		
12	34 28	35 00	24 48	21 49	25 30 Azim. 24 53 Amp. Weſtly.
13	34 55	34 38	24 03	21 01	
14	35 12	. . .	24 00		
15	35 22	35 19	22 41	19 57	23 38 Azim.
16	35 35	35 44	20 29	17 47	
17	34 58	34 46	18 28		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
May.	Above the freezing point.		
11	14,0	S. W. faint, followed by calm; fine weather.	On the 12th, at ſun-riſe, Cape *of the Mountains* bore N. N. W. 3° W.
12	18,0	From E. N. E. to N. E. pleaſant breeze; fine weather.	On the 12th, at 9h 18′ 14″ A.M. Long. by 2 ſets ☽ — ☉ } *M.* and *Ch.* } 0 ′ ″ 22 01 30 E. At noon, the environs of the Cape of the *Mountains* bore from N. by E. 3° N. to N. W. 3° N. 10 or 12 leagues from the coaſt; no bottom with a line of 100 fath.
13	17,0	From N. E. to W. S. W. round by the N. and W. var. freſh breeze; weather overcaſt.	On the 13th, at 10h 50′ A.M. Long. by 2 ſets ☽ — ☉ } *M.* and *Ch.* } 0 ′ ″ 21 01 40 E.
14	15,0	From W. to S. E. by S. moderate, followed by ſqualls; weather overcaſt.	On the 15th, at 8h 43′ A.M. Long. by 2 ſets ☾ — ☉ } *M.* and *Ch.* } 20 12 00 E. On the 15th, at 5 P.M. perceived the land (the environs of *Cow Bay*) to the N. as far as it could be ſeen.
15	15,0	From S. E. to E. S. E. moderate; fine weather.	On the 16th, at 8h 51′ A.M. Long. by 2 ſets ☾ — ☉ } *M.* and *Ch.* } 0 ′ ″ 18 04 22 E The ſame day, at noon, ſounded in 95 fathoms, fine oozy ſand.
16	15,0	From E. S. E. to S. E. moderate; fine weather	On the 17th, at 1 A.M. ſounded, but could not ſtrike ground with a line of 150 fathoms: we were then to the weſtward of the *Aiguillas* Bank. In the forenoon, we doubled the Cape of *Good Hope*, which muſt have borne at noon N.
17	15,0	From S. S. E. to E. S. E. moderate: fine weather.	E. by N. 12 or 13 leagues: the fog which covered the land prevented it from being ſeen.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. EAST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
May 18	33 44	33 45	16 49	. . .	23 28 Amp. Eaſtly.
19	33 29	33 29	15 49		
20	32 14	31 59	14 37		
21	30 16	30 06	12 39	. . .	21 34 Azim. 21 49 Amp. Weſtly.
22	28 31	28 29	10 53	. . .	20 24 Amp. Weſtly.
23	27 04	27 13	9 34		
24	26 22	26 11	8 41		
25	25 28	25 28	8 30	4 42	20 06 Amp. Eaſtly.
26	24 00	23 48	7 15	. . .	20 14 Azim.
27	22 54	22 49	6 22		
28	22 24	22 06	5 55	0 58	20 08 Amp. Eaſtly. 19 54 Amp. Weſtly.
29	20 52	20 52	4 50	WEST. 0 15	
30	19 19	19 13	3 21	1 43	19 17 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
May	Above the freezing point.		
18	15,5	From E.N.E. to N.N.E. moderate breeze; fine weather.	Saw constantly *Albatrosses*, *Pintadoes*, *Petrels*, *Alcyons*, &c.
19	15,0	From N. E. to W. by N. light breeze, followed by squalls; weather overcast.	
20	12,0	From S. W. to S. S. W. strong gale and squally; weather overcast.	On the 22d, saw some *Porpoises*. On the 23d, saw some *Whales*. The *Albatrosses* and *Pintadoes* begin to diminish; saw no more *Petrels*.
21	13,0	From S. to S. S. E. fresh breeze; fine weather.	
22	14,0	S. S. E. moderate breeze; fine weather.	On the 25th, at $3^h\ 07'\ 12''$ P.M. Long. by 1 set ☉ — ☾ } *Ch.* . . . 0° 4′ 38″ 00 E.
23	15,0	Ditto, variable, light breeze; cloudy weather.	
24	16,0	From E. S. E. to S. S. W. light, followed by calm; weather overcast.	The same day, at 11 P. M. saw a very luminous meteor. In the night from the 25th to the 26th, passed a quantity of *Mollusca*: the sea was luminous; saw no more *Pintadoes* or *Albatrosses*.
25	17,0	From N. to S. W. round by the W. light breeze; fine weather.	On the 27th, passed a piece of wood.
26	16,0	From S. S. W. to S. E. moderate; gloomy weather.	On the 28th, at $2^h\ 27'\ 23''$ P.M. Long. by 2 sets ☉ — ☾ } *M.* . . 0° 52′ 15″; *Ch.* . . 0 56 45; Mean . 0 55 00 E. Saw some *Mollusca*, *Doradoes* and large *Whales*.
27	17,0	From S. E. to S. S. E. light, calm at intervals; gloomy weather.	
28	17,5	From W.S.W. to S.S.W. light breeze; cloudy weather.	On the 29th, at $2^h\ 44'\ 10''$ P.M. Long. by 2 sets ☉ — ☾ } *M.* . . 0° 22′ 00″W.; *Ch.* . . 0 25 00; Mean 0 23 30W.
29	18,0	From S. to E. S. E. moderate; fine weather.	
30	18,0	From E S. E. to S. E. fresh breeze; misty weather, followed by fine weather.	On the 30th, at $3^h\ 46'\ 49''$ P. M. Long. by 2 sets ☉ — ☽. } *M.* and *Ch.* } 1 57 00W.

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. EAST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
May 31	17 39	17 26	1 54		
June 1	16 19	16 13	0 24	. . .	17 46 Azim.
2	15 58	15 47	WEST. 1 13	. . .	15 15 Amp. Weſtly.
3	15 52	15 49	2 24	. . .	15 19 Amp. Eaſtly. 15 06 Azim.
4	15 57	. . .	3 00		
	Point arrived at in ſight of the Iſland of *St. Helena*, at 9 o'clock in the morning.				
	. . .	15 53	. . .	8 03 30″	
5	At anchor in the Road of the Iſland of *St. Helena*.				
6	Point of departure in ſight of the Iſland of *St. Helena*.				
	. . .	15 48	. . .	8 14 00	
7	15 01	14 53	8 08	. . .	15 04 Azim.
8	14 01	13 55	8 47		
9	13 24	13 20	9 26	. . .	15 06 Azim.
10	12 25	12 21	10 29	. . .	14 13 Amp. Weſtly
11	11 09	11 10	11 51		
12	9 50	9 56	13 19		
13	8 27	8 29	14 40		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
May	Above the freezing point.		
31	19,0	S. E. moderate breeze; fine weather.	In the afternoon of the 31ſt, ſaw a *Booby*, and we were ſurpriſed to ſee a *Pintado* in theſe latitudes.
June			
1	19,0	From E. S. E. to S. E. by S. light breeze; fine weather.	
2	19,6	From S. to E. S. E. variable light; fine weather.	
3	19,5	From S. S. E. to E. S. E. faint; fine weather.	On the 3rd, at 11 A. M. ſaw the Iſland of *St. Helena*. At noon, it bore W. by S. at the diſtance of about 12 leagues.
4	19,5	S. E. light breeze; fine weather.	
5	19,0	S. E. light; variable and calm; fine weather.	On the 4th, at 9 A. M. the eaſt extremity of the Iſland of *St. Helena* bore S. and *Sugar-loaf* Point W. S. W. 2° W. At ½ paſt 10 anchored in the Road of *St. Helena* in 13 fathoms, over a bottom of fine gray ſand; *Sugar-loaf* Point bearing N. E. by E. 2° E. *Munden* Point S. S. E. 2° S. and the flag-ſtaff of the Governor's houſe S. by E. 2° S.
6	19,5	From N. to W. N. W. light breeze; fine weather.	
7	19,5	From W. N. W. to W faint; cloudy weather.	
8	20,0	From S. S. W. to S. E. light breeze; fine weather.	On the 5th, at 10 P. M. got under way.
9	19,5	S. E. light; almoſt calm; fine weather.	On the 6th, at noon, the Iſland of *St. Helena* bore from S. S. E. 4° E. to S. E. by E. 2° S. whence we took our departure.
10	21,0	From E. S. E. to S. E. light; fine weather.	
11	19,0	From S. E. by S. to E. S. E. freſh in ſqualls; weather overcaſt.	On the 7th, at noon, we ſtill ſaw the Iſland of *St. Helena*, bearing S. diſtant about 21 leagues.
12	20,0	S. E. var. moderate, accompanied by ſqualls; weather cloudy.	On the 8th, 9th and 10th, ſaw ſome *Boobies* and *Bonitees*.
13	19,0	From S. E. to E. freſh in ſqualls; weather cloudy.	

TIME.	LATITUDE by account. SOUTH.	LATITUDE by obſerv. SOUTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
June 14	6 55	6 55	16 02	. . .	12 36 Azim.
15	5 48	5 39	17 49		
16	4 27	4 20	19 37	. . .	11 24 Azim.
17	3 11	3 08	21 19	. . .	11 14 Azim.
18	1 41	1 57	22 46	. . .	10 58 Amp. Eaſtly
19	0 41	0 57	24 02	. . .	10 46 Azim.
20	NORTH. 0 22	NORTH. 0 38	25 19	. . .	9 17 Azim.
21	2 06	2 34	26 30	. . .	8 47 Azim.
22	4 19	4 34	27 25	. . .	8 02 Azim.
23	6 20	. . .	28 03	. . .	8 14 Azim.
24	7 18	. . .	28 24		
25	7 32	8 15	28 49	. . .	8 54 Azim.
26	9 21	9 21	30 21	. . .	7 08 Azim.
27	10 43	11 05	31 51		
28	12 14	12 20	33 44		

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
June	Above the freezing point.		
14	21,0	S. E. moderate breeze; fine weather.	On the 14th, saw a number of *Boobies*, *Tropic Birds* and *Terns*.
15	21,5	S. E. pleasant breeze; fine weather	
16	22,0	From E. S. E. to E. moderate breeze; fine weather.	
17	22,5	E. pleasant breeze; fine weather.	On the 17th, saw some *Man-of-war birds* and *Boobies*.
18	22,0	S. E. by E. moderate; fine weather.	On the 18th, saw a number of *Flying-fishes*, a few *Tunnies*, and some *Boobies*.
19	22,0	S. E. by S. pleasant breeze; fine weather.	
20	21,5	Ditto, moderate; fine weather.	
21	22,5	S. E. by E. moderate; fine weather.	On the 21st, saw a number of *Flying-fishes* and *Bonitoes*.
22	23,5	From S. E. fresh breeze to S.S.E. moderate and squally; weather overcast.	
23	22,6	From S. S. W. to S.S.E. fresh; weather overcast and rain.	
24	23,5	From S. S. E. to N.N.E. round by the W. faint; calm and rain.	
25	23,5	From N.E. by N. to N.E. moderate; cloudy weather.	
26	23,0	From N. E. to E. N. E. pleasant breeze; cloudy weather.	
27	23,0	From N.E. by E. to N.E. by N. fresh; cloudy weather.	
28	23,0	Ditto, ditto.	

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
June 29	13 24	13 33	35 19		
30	14 51	14 58	36 21	. . .	5 27 Azim.
July 1	16 32	16 37	37 25	. . .	6 00 Azim.
2	18 10	. . .	38 52		
3	19 45	19 49	40 08	. . .	5 50 Azim.
4	21 24	21 25	40 58		
5	23 06	23 03	41 40	. . .	5 36 Azim.
6	24 30	. . .	42 08	. . .	6 56 Amp. Weſtly.
7	25 51	26 00	42 19	. . .	7 35 Azim.
8	27 29	27 50	42 37	. . .	8 00 Azim.
9	30 03	30 05	43 01	. . .	9 54 Azim.
10	32 10	32 23	43 30	46 27	9 42 Azim.
11	34 05	34 15	44 35	. . .	12 26 Azim.
12	35 51	35 59	44 58	. . .	13 59 Azim.

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
June	Above the freezing point.		
29	22,0	From N.N.E. to E.N.E. ſqually and miſty; weather overcaſt.	
30	22,0	From N. E. by E. to E. by N. moderate; fine weather.	
July 1	22,5	From E. by N. to N. E. by N. freſh breeze and ſqually; fine weather.	
2	22,0	From E. N. E. to N. E. freſh in ſqualls; weather overcaſt.	From the 2nd to the 12th, we were conſtantly meeting with the ſpecies of ſea-weed called *Raiſins du Tropique*.
3	22,5	From E. to N. E. by E. freſh; fine weather.	
4	20,0	From E. N. E. to N. E. moderate; fine weather.	
5	22,0	From E. to E. N. E. moderate and ſqually, with rain after the ſqualls.	
6	21,0	Eaſt, var. ſqually with rain; cloudy weather.	
7	22,0	Ditto, ditto.	
8	22,0	Ditto, ditto.	
9	22,5	From E. to E.N.E. freſh; fine weather.	
10	21,5	Ditto, ditto.	On the 10th, at 8^h 22′ A. M. Long. by 4 ſets ☽ — ☉ } *M.* and *Ch.* } ° ′ ″ 46 22 30 W.
11	21,5	From E. N. E. to E. freſh breeze; fine weather.	
12	21,0	From E. to E.S.E. faint; fine weather.	On the 12th, ſaw ſome *Mollusca*.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′	° ′	° ′	° ′
July 13	36 24	. . .	44 45		
14	36 19	36 07	44 15	. . .	14 30 Azim.
15	35 58	36 03	43 33	. . .	15 28 Azim.
16	36 06	36 16	43 21	. . .	15 31 Amp. Eaſtly.
17	36 43	36 52	43 15	. . .	15 04 Amp. Eaſtly.
18	38 13	38 18	41 33	. . .	16 40 Azim.
19	39 18	39 20	39 56	. . .	19 08 Azim.
20	40 25	40 25	37 53	. . .	21 30 Amp. Weſtly.
21	40 57	41 03	36 03		
22	41 32	41 24	33 57		
23	41 42	41 22	32 03	34 32	
24	41 50	41 42	29 55	32 18	
25	41 44	41 46	27 52	. . .	24 08 Azim.
26	41 48	41 43	25 16	. . .	22 17 Amp. Weſtly.
27	41 19	41 13	22 35	25 32	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
July	Above the freezing point.		
13	20,5	From N. to N. E. faint; fine weather.	
14	21,0	From N. N. E. to N. E. faint; fine weather.	
15	21,0	Variable and faint; fine weather.	On the 15th saw a *Turtle.*
16	21,5	Calm; fine weather.	
17	21,0	From S. S. W. to N. W. by N. light breeze, fine weather.	On the 17th, saw some *Bonitoes*; passed a piece of wood.
18	21,0	From W. to N. W. fresh breeze; fine weather.	
19	19,5	N. W. moderate; fine weather.	On the 19th, met with two large pieces of wood.
20	21,0	From N. W. to W. moderate; slight fog; fine weather.	
21	19,0	W. by S. moderate; fine weather.	On the 21st, saw some *Flying-fishes* and *Mollusca.*
22	18,0	W. by N. moderate; misty weather.	On the 22d, saw a *Turtle.*
23	19,0	From W. by S. to N. W. moderate; misty weather.	On the 23d, at 2^h 15′ 43″ P.M. by 2 sets ☉ — ☾ Long. *M.* and *Ch* ° ′ ″ 34 13 00W
24	18,0	From N. W. to W. light breeze; misty weather.	We saw constantly some *Mollusca.*
25	18,0	From W. N. W. to N. N. E. moderate; fine weather.	On the 24th, at 2^h 55′ P. M. by 2 sets ☉ — ☽ Long. *M.* and *Ch.* 32 05 00W.
26	17,5	From N. to W. N. W. moderate; fine weather.	On the 25th, saw a *white Tern* and two *Turtles.*
27	17,0	From N. to W. N. W. moderate; fine weather.	On the 27th, at 4^h 26′ 33″ P. M. by 2 sets ☉ — ☾. Long. *M.* and *Ch.* ° ′ ″ 25 14 00W.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	LONGITUDE by account. WEST.	LONGITUDE by obſerv. WEST.	VARIATION of the Compaſs WEST.
1792.	° ′	° ′	° ′	° ′	° ′
July 28	40 54	40 54	20 25		
29	40 16	40 16	18 23		
30	39 37	. . .	16 37		
31	38 48	38 28	14 09		
Aug. 1	38 09	38 09	11 39		
2	37 14	. . .	10 00		
	Point of departure in ſight of Cape *St. Vincent.*				
	. . .	37 02	. . .	11 31	
3	36 17	36 08	10 14	. . .	21 12 Azim.
	35 49	. . .	8 53	. . .	
	Point arrived at in ſight of Cape *Spartel* at 5 o'clock in the morning.				
4	. . .	35 49	. . .	8 16	22 06 Azim.
	At noon,	36 05	. . .	. . .	
	The Point of *Gibraltar* bearing W. ½ N. 7 leagues diſtant, and the *Mont aux Singes* S. W. ½ S.				

			REDUCED courſe CORRECTED.	REDUCED diſtance CORRECTED.	
5	36 31	36 31	E. by N.E. 4° N.	34,0	
6	37 11	37 21	N. E. by E. ½ E.	36,0	
7	38 34	38 40	N. N. E. ½ E.	29,5	19 23 Amp. Eaſtly.
8	39 20	39 32	N. ½ E.	17,5	
9	40 05	40 17	N. E. by N. 1° N.	18,0	21 00 Azim.
10	40 35	40 45	N. E. 2° N.	13,0	

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
July	Above the freezing point.		
28	18,0	From W. to W. N. W. moderate; cloudy weather; ſlight miſt.	
29	18,0	From W. N. W. to N. E. moderate; weather overcaſt and miſty.	On the 1ſt of Auguſt, paſſed ſeveral patches of ſea-weed interwoven, called *Lacets*.
30	17,0	N. E. by E. freſh breeze; weather overcaſt.	On the 2d of Auguſt, at ½ paſt 3 A.M. Saw the land to the northward of Cape *St. Vincent*. At 5 A. M. the part of the coaſt in ſight bore from N. by E. to S. by W. In the forenoon, paſſed through ſome boars of currents which ſet to the S. E. At noon, Cape *St. Vincent* bore E ½ S. 2 ½ leagues, whence we took our departure.
31	17,0	N. E. by N. freſh; fine weather.	
Aug.			
1	17,5	From N. E. by N. to N. by E. pleaſant breeze; fine weather.	
2	17,0	From N. E. to N. N. W. pleaſant breeze; fine weather.	On the 4th of Auguſt, at ½ paſt 3 A.M. ſaw the land. At 5, diſtinguiſhed Cape *Spartel*, which bore S. E. 2 or 2 ½ miles. The currents ſet rapidly to the eaſtward, towards the Strait of Gibraltar. At 6, entered the Strait, and before noon we were ſtanding up the Mediterranean with all ſail ſet.
3	19,0	From E. to W. round by the N. faint; fine weather.	
4	19,0	From W. to N. W. moderate; fine weather.	
5	20,0	From W. to N. W. moderate; fine weather.	On the 5th, at noon, the Point of *las Roquetas* bore N. N. E. ½ E. 3 or 4 leagues.
6	22,0	W. N. W. faint; ſhowery weather.	
7	22,5	From S. S. E. var. faint to S. W. freſh; fine weather.	On the 6th, at noon, Cape *Palos* bore North.
8	23,0	From N. W. to N. E. moderate breeze; fine weather.	On the 7th, at noon, Cape *Sant Antonio* bore N. 4° W. Mount *Bindorme* W. S. W. 7° W.
9	24,0	From E. S. E. to S. W. variable, faint; fine weather.	On the 8th, at noon, the Mountain of *Oropeſa* bore N.W. by N. or 2° N. Cape *Cullica*, W. 4° S.
10	23,5	From N. E. to N. var. faint; fine weather.	On the 10th, the coaſt of *Spain* extended from N. N. E. to W. S. W. at the diſtance of 9 leagues.

TIME.	LATITUDE by account. NORTH.	LATITUDE by obſerv. NORTH.	REDUCED courſe CORRECTED.	REDUCED diſtance CORRECTED.	VARIATION of the Compaſs. WEST.
1792.	° ′	° ′			
Aug. 11	41 04	41 11	N.E. by E. 2° E.	14,7	
12	41 38	41 41	E. N. E. 2° N.	24,0	
13	42 04	42 09	N. E. 4° E.	14,5	
14	In ſight of Cape *Sépet*, *Toulon* Road.				

DAYS.	DEGREES of the THERM.	WINDS AND WEATHER.	REMARKS AND OBSERVATIONS.
Aug.	Above the freezing point.		
11	24,0	Variable and faint, with intervals of calm; fine weather.	On the 11th, Mount *Jui* bore N. 1 or 2° E. 3 leagues.
12	24,5	From W. S. W. to S. faint, almoſt calm; fine weather.	On the 12th and 13th, croſſed the Gulf of *Lyons* out of ſight of land.
13	23,5	From W. S. W. to W. faint; fine weather.	On the 14th, in the morning, ſaw Cape *Sépet*. In the afternoon of the ſame day, anchored in the inner Road of *Toulon*, in 3½ fathoms, muddy bottom.
14	23,0	Weſt, moderate breeze; fine weather.	

THE END.